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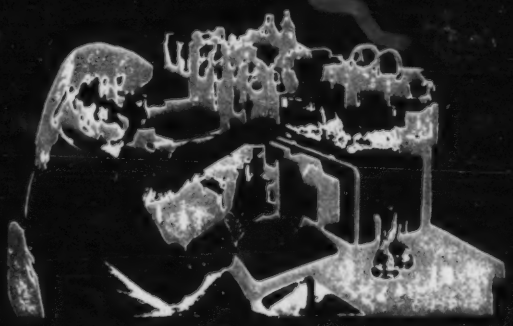
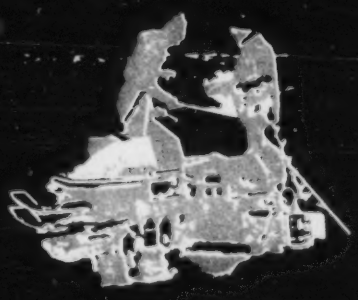
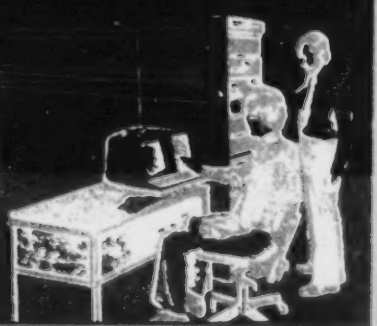
Water Quality Branch

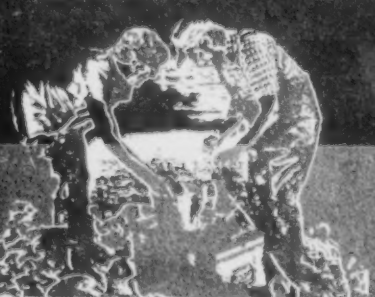
Direction de la qualité des eaux

Canada









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WATER QUALITY BRANCH ACTIVITIES 1987-1988

ACTIVITES DE LA DIRECTION DE LA QUALITE DES EAUX 1987-1988

A. SUMMARY

This report documents the Water Quality Branch's plans for water quality assessments, laboratory operations, water quality objectives and other activities for the fiscal year 1987-88.

The publication provides details of the Water Quality Branch headquarters and regional programs and their respective projects. The details include: goals and rationale, brief project description, station locations, frequency of sampling and parameters measured, person-years and financial resources required.

The document has been compiled from the 87/88 project sheets, prepared at the beginning of the fiscal year; consequently it does not contain any projects initiated since then. Major omissions are not expected however, and the projects were on schedule at printing time in August 1987. A comparison of Table 1 with Tables 3 - 5 reveals discrepancies between various numbers. The figures of Table 1, provided by the C&P Finance and Administration, represent the actual resources allocated to the WQB as of April 1987. Tables 3-5, as mentioned above, were compiled from planning papers.

The document is for internal use by the WQB and it provides a record of the Water Quality Branch programs and projects. It should also provide useful information for senior management.

2. RESUME

Le présent rapport énonce les travaux de laboratoire, les activités en matière de surveillance et d'objectifs de qualité de l'eaux et les autres opérations que la Direction de la qualité des eaux se propose d'effectuer au cours de l'année financière 1987-88.

Le présent rapport décrit les programmes et les projets des bureaux régionaux et de l'administration centrale de la Direction de la qualité des eaux. Les détails comprennent les objectifs et leur justification, de brèves descriptions des projets, l'emplacement des stations, la fréquence des échantillonnages, les paramètres mesures et les ressources humaines et financières nécessaires.

Ce document a été établi à partir des fiches de projets pour 1987-88, lesquelles ont été rédigées au début de l'année financière; par conséquent, il ne donne aucun renseignement sur les projets qui ont été élaborés depuis avril 1987 au cours de l'année financière. La majorité des projets y sont énumérés cependant, et aucun projet n'était en retard au moment de l'impression, soit en août 1987. Une comparaison entre le Tableau 1 et les tableaux 3 à 5 démontre certaines différences. Ces dernières s'expliquent du fait que les données du Tableau 1, qui ont été fournies par l'administration centrale de la C&P représentent les ressources qui avaient été accordées à la Direction de la qualité des eaux en avril 1987, tandis que les tableaux 3 à 5 ont été établis à partir des fiches de projects.

Le document n'est destiné qu'à la Direction de la qualité des eaux. Il constitue un inventaire des programmes et projets de cette direction. Il devrait en outre se révéler utile aux cadres supérieurs à titre d'information.

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B. INTRODUCTION

B.1 Inland Waters/Lands Directorate

The Inland Waters/Lands Directorate (IW/LD) has the prime federal responsibility for monitoring freshwater resources in Canada. The Directorate's work is carried out by Water Quality, Water Resources, Water Planning and Management, the Research Coordination and Program Evaluation and Lands Branches at headquarters, and five regional offices across Canada. In addition, two institutes - the National Hydrology Research Centre (NHRC), in Saskatoon, and the National Water Research Institute (NWRI), Burlington, comprise the research components of the Directorate.

B.2 Purpose of the Water Quality Branch

Within IW/LD, the purpose of the Water Quality Branch (WQB) is to promote the conservation and enhancement of the quality of Canada's inland water resources for the economic and social benefit of Canadians by providing scientific and technical information and advice on water quality.

Additional information of the purpose, role and activities of the Branch can be found in the "Business of the Water Quality Branch", (Ottawa, 1985).

B.3 Role of the Water Quality Branch

The role of Water Quality Branch is:

1. To provide scientific and technical information and advice to government, private agencies and the public, and to promote the wise management of the quality of waters:

    a) shared by Canada and the United States, and by one or more provinces and/or territories;

    b) on federal lands, such as national parks, Indian reserves, heritage canals; and other properties and facilities where water resource management is primarily a federal responsibility;

    c) where there is federal responsibility, such as for fisheries and wildlife;

    d) subject to impact by federally funded projects.

2. To detect emerging water quality problems and to evaluate water quality issues concerning Canada's inland waters from regional and national point of view.

The Branch's role is operational. Research and related support services are provided by the research institutes, NWRI and NHRC. The Branch in turn provides operational support to both institutes.

B.4 The Structure of the Water Quality Branch

The Water Quality Branch comprises an interdisciplinary team of chemists, biologists, geologists, hydrologists, geographers, meteorologists, technicians, computer scientists, clerks and secretaries, each of whom fills a specialized role in the complex undertaking of measuring and assessing water quality.

The branch is decentralized with Headquarters in the National Capital Region and regional offices in Moncton, N.B. (Atlantic region); Longueuil, Que. (Quebec Region); Burlington, Ont. (Ontario Region); Regina, Sask. (Western and Northern Region); and Vancouver, B.C. (Pacific and Yukon Region). The Western and Northern Region also has district offices located in Winnipeg (Manitoba), Calgary (Alberta), and Saskatoon (Saskatchewan), and a water quality specialist located in Yellowknife (NWT). (See Figure B1 for a branch organization chart).

Administratively, the headquarters and regional components function under different lines of authority, with the Headquarters group reporting through the Water Quality Branch Director to the Director General, Inland Waters/Lands Directorate, and the regional offices reporting through their respective Regional Director or to a Regional Director General.

B.5 Headquarters and Regional Roles

The headquarters and the regional offices share the responsibility for delivering an effective and efficient federal water quality program. Figure B2 shows the major responsibilities and linkages of the regional offices, headquarters and the national laboratory.

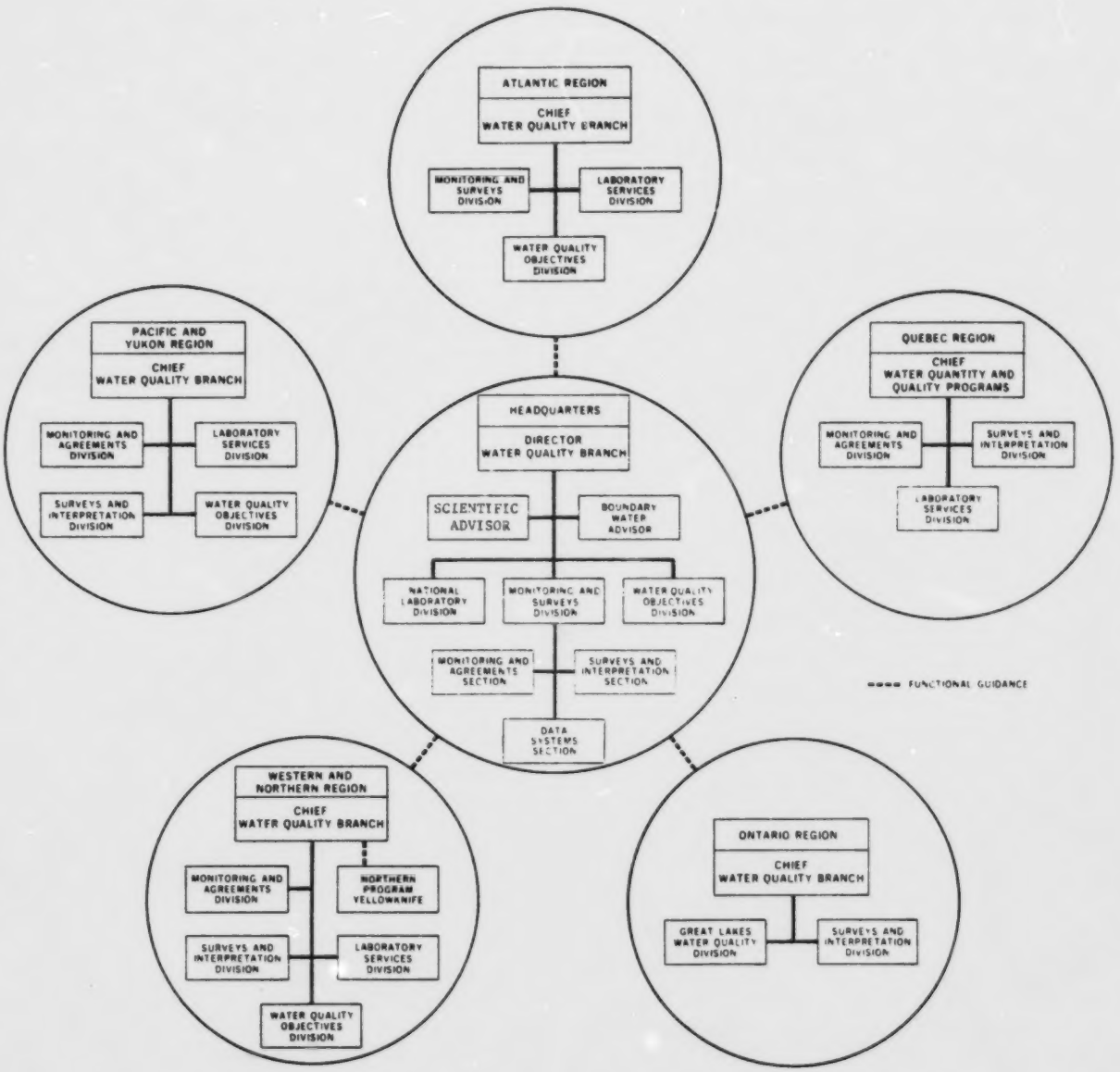
Headquarters is responsible for coordinating water quality programs to meet national requirements. It also formulates national policies and provides guidance in the development of the operational plans, establishes national goals and priorities, prepares nationally focussed water quality reports, and provides information and advice on water quality. The regional offices are responsible for planning, designing and implementing water quality programs and for providing water quality information and advice.

Both headquarters and the regional offices share the responsibility for identifying research needs relevant to achieving branch objectives. Operational contacts are appointed to liaise with researchers in both government and private sectors. In this way, the Branch influences the direction of research undertaken by the two national research institutes and transfers research results to the operational program.

The National Water Quality Laboratory is located at Canada.Centre for Inland Waters (CCIW) in Burlington (Ontario). Smaller regional laboratories are located in Moncton, Longueuil, Saskatoon and Vancouver.

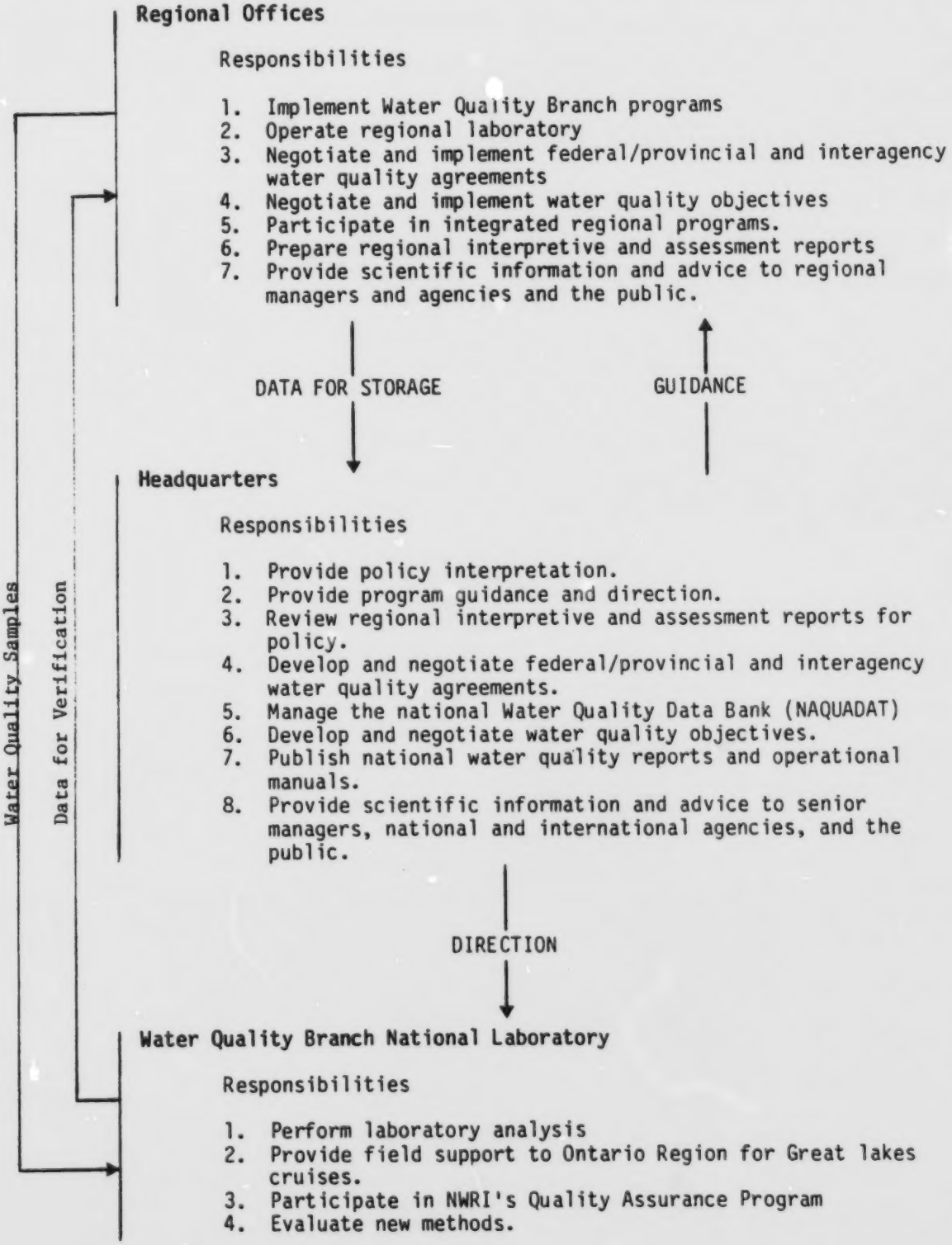
Headquarters is also responsible for the National Water Quality Data Bank (NAQUADAT), a computerized data storage and retrieval system, operated and maintained by the Water Quality Branch. NAQUADAT contains data from some 5000 locations in Canada. The system stores the results of environmental analyses and other data about the samples and sampling locations, and produces a large variety of graphical and statistical reports.

FIGURE B1: SCHEMATIC ORGANIZATION OF THE HEADQUARTERS AND THE REGIONAL OFFICES OF THE WATER QUALITY BRANCH (WQB)



* FIVE REGIONAL OFFICES LOCATED IN VANCOUVER, REGINA (CALGARY, SASKATOON AND WINNIPEG), BURLINGTON, LONGUEUIL AND MONCTON.

Figure B.2: Responsibilities within the Water Quality Branch



B.5.1 Divisional Responsibilities

The Branch, at headquarters and in the regions, has three divisions briefly described below.

B.5.2 Monitoring and Surveys Division

This Division is responsible for the measurement and assessment activities of the branch including planning of projects, collection of samples, interpretation of data and preparation of reports. Much of this work is integrated with provincial programs through the Federal-Provincial Water Quality Agreements

The Division also develops policies, negotiates water quality monitoring agreements and provides information and advice for the management of water resources.

B.5.3 National Water Quality Laboratory

Located in the Canadian Center for Inland Waters (CCIW) in Burlington, Ontario, the National Laboratory is responsible for providing water quality data by analyzing environmental samples sent in by the branch's regional offices located in Burlington, Moncton, Longueuil, Regina and Vancouver as well as other government agencies. Staff provide an advisory and consultative service to senior officials, scientists and researchers in the Department, other departments and agencies on analytical chemistry, laboratory operations, water chemistry and data interpretation. The National Laboratory maintains the "Analytical Methods Manual" which documents the approved methods and techniques used by analysts in the branch laboratories and many other federal, provincial and private laboratories.

B.5.4 Water Quality Objectives Division

The Water Quality Objectives Division provides the Branch with the expertise for formulating and applying water quality objectives for the management of Canada's inland waters, and for evaluating their effectiveness. An important component in their activities is the provision of information on the effects of various pollutants on water uses.

In May, 1987, the Objectives Division released the "Canadian Water Quality Guidelines" which it prepared for the Canadian Council on Resource and Environment Ministers. Work is continuing on the preparation of new and revised guidelines, with particular emphasis on guidelines for pesticides in current use, in collaboration with Agriculture Canada.

In 1987, a series of information sessions are planned to introduce and explain the use of the Canadian Water Quality Guidelines to water managers, particularly at the provincial level, across Canada.

Work is continuing, at headquarters and in regional offices, on establishment or revision of objectives on the St. Croix, Ottawa, Red, Souris, Flathead and Similkaween Rivers, the Fraser Estuary and elsewhere.

Work is also continuing on a report "Water Quality at the Canada - US Boundary - The status of Water Quality Objectives". The report will review the role of water quality objectives in helping to manage water quality and implications for the Boundary Waters Treaty.

B.6 Federal/Provincial Water Quality Agreements

In January 1982, Environment Canada obtained Cabinet approval to negotiate agreements with the provinces for the collection of water quality data and information. These agreements will provide for long-term commitments and compatible data bases, accurate and comprehensive information and improved federal-provincial relations, as well as significant improvements in the efficiency and effectiveness of WQB's program.

The first agreement with the province of Québec was signed in May 1984. Agreements were also signed with the provinces of Newfoundland (April 1986) and British Columbia (October 1985). Negotiations with New Brunswick have reached their final phase. Negotiations have been initiated with the remaining provinces and territories. Alberta where negotiations were discontinued due to provincial spending restraint, efforts are being made to get discussions going again.

The river basin concept is the basic approach used for the planning of water quality activities covered by a given agreement (Water Quality Branch Stategy for the Assessments of Environmental Quality, 1986). Governments cooperatively identify water quality issues of concern. Then the most representative basins related to these issues are chosen. For stations of interest to both federal and provincial governments the cost of data collection is shared.

The agreements include joint planning and data interpretation, regular exchange of information; and compatible sampling, analytical and quality assurance protocols. Station operation varies from one agreement to another. In the Quebec agreement, the federal-provincial stations are operated by the province. Newfoundland and British Columbia Agreements are based in the work-sharing principle. The help achieve uniformity, a Task Force was established in October 1986 to develop a strategy for implementing federal-provincial water quality monitoring agreements. Its final report is expected in June 1987. This report will include recommendations which will set the course for coming agreements.

B.7 Resources

In order to conduct its activities the Branch has a budget (1987-88) of approximately million and person-years plus some additional, non A-base resources. Part of this budget is committed to analytical support of the departmental research programs. More detailed breakdowns of these resources are shown in Tables 1-5.

B.8 Objectives of the C&P National Program to which WQB Contributes

1.1 Canada - U.S. and Interjurisdictional Water Management

To resolve interjurisdictional water resource problems and realize interjurisdictional water resource opportunities in accordance with national interests.

1.3 Water Quality Management Data

To provide comprehensive, accurate and timely data, information and advice on the quality of Canada's inland waters.

1.5 Water Management Research

To advance knowledge and provide information and understanding required for the solution of water management problems and the realization of water development opportunities.

1.6 Management and Administration

To plan, manage and control the policies, programs and activities of the Inland Water Directorate in an effective and efficient manner.

4.1 Toxic Chemicals

To provide information on the characteristics and presence of toxic chemicals in the environment, the pathways of these chemicals through ecosystems, and knowledge of their actual and potential impacts on the environment.

4.2 Long-Range Transport of Airborne Pollutants (LRTAP)

To monitor, predict and evaluate impacts of airborne pollutants on aquatic and terrestrial ecosystems.

4.3 Environmental Assessment and Baseline Studies

To participate effectively in the Environmental Assessment and Review Process and to provide environmental knowledge and predictive capability which will ensure that federal decisions on major development proposals reflect environmental and renewable resource concerns.

Each project description of Chapter D shows the national program to which the project contributes.

C. SUMMARY OF RESOURCES (TABLES)

Table 1
Water Quality Branch
Allocation of Resources 1987-88 ($'000)

Item	H.Q. PVM	H.Q. Lab.	Atl.	Que.	Ont.	W&N	NWT	P&Y	Total Allocation	Total Estimated
Person-Years										
A-base	28.75	42.0	87.0	8.8	11.25	25.00	1.49	18.6	162.89	164.93
non A-base			1.0	-	2.00			0.2	3.20	4.21
Salaries										
A-base	1244.20	1303.00	980.00	308.00	519.90	862.10	58.70	795.00	6138.20	6241.31
non A-base			44.00	-	70.00			8.50	122.50	156.00
Operating										
A-base	314.27	465.26	203.00	117.90	124.90	576.7	109.10	391.00	2287.76	2204.23
non A-base	40.00	365.25	134.25	88.20	70.00	164.5		41.50	903.70	909.30
Capital										
A-base	94.50	294.52	98.30	58.00	15.70	95.50	2.80	?	625.80	692.02
non A-base			25.00	-	15.00				40.00	25.50
Grants & Contrib.				197.00					197.00	197.00
TOTAL										
A-base	1652.97	2062.78	1281.30	680.90	660.50	1534.30	170.60	1186.00	9248.76	9334.56
non A-base	40.00	365.25	203.25	88.20	155.00	164.50		50.00	1066.20	1120.80

NOTE: This table shows the resources allocated to the W.Q.B's units at the start of the fiscal year. The last column totals show the estimated resources. Differences are due to early estimates and resource shifts during the year. The tables which follow are based on estimated resources.

Table 2
Summary of Stations in Water Quality Branch Programs 1987-88

C&P Programs/ WQB Projects	NFLD &LAB	PEI	NS	NB	QUE	ONT	MAN	SASK	ALTA	NWT	BC	YUK	TOTAL
1.1 CAN-US & INTERJURISDICTIONAL WATERS													
International				18		11	4	5	6				44
Great Lakes						259							259
Interprovincial							5	6	4(1)	5			20(1)
Atmospheric Precip.						15							15
Prairie Prov. Water Board							(1)	(6)	(4)				(11)
Water Quality Objectives									(2)				(2)
Other							3						3
Subtotal				18		285	12(1)	11(6)	10(7)	5			34(14)
1.3 WATER QUALITY MANAGEMENT DATA													
International											(17)	(1)	(18)
Interprovincial											(3)	(5)	(8)
G.E.M.S.				(1)	(1)	(1)	(2)			(2)	(1)		(8)
Atl. Region Overview		(1)	(7)	6(3)									14(3)
W&N Adhoc Agreements							14	5	5				24
Nat. Parks Agreement						3				3			6
Other							(7)	2(2)		36			38(9)
Monitoring Agreements													
Federal					60						20		87
Fed/Prov. (cost shared)					297						23		302
*Provincial					111**						50**		161**
Subtotal		1	7	6(4)	339(1)	3(1)	14(9)	7(2)	5	39(2)	43(21)	7(6)	471(46)
4.1 TOXIC CHEMICALS													
Radionuclides	1			1(1)	2(1)	3		(2)	(1)				7(5)
Organics in Precip.		1	2					(4)					3(4)
Toxic Chemicals						39	6		(1)	(7)			45(8)
Subtotal	1	1		3(1)	2(1)	42	6(4)	(2)	(2)	(7)			(55(17)
4.2 LONG RANGE TRANSPORT OF AIRBORNE POLLUTANTS													
LRTAP Monitoring	45	2		68(3)	4 41								160(3)
Subtotal	45	2		68(3)	4	41							160(3)
TOTAL FEDERAL	46	4		78	30	143	294	26	18	15	44	20	7	725
TOTAL FED./PROV.						279						23		302
TOTAL FED.& FED./PROV.	46	4		78	30	422	294	26	18	15	44	43	7	1027
TOTAL PROVINCIAL*						111						50		161
GRAND TOTAL	46	4		78	30	533	294	26	18	15	44	93	7	1188

( ) Denotes stations that have been accounted for in other program numbers
* Data from Provincial stations are available to DOE as required.
** Not added here - but included below in grand total.

Table 3 Water Quality Branch Summary of Resources
by Region for C&P National Programs - 1987-88 (estimated)

Region / C&P National Program	Person Years	Financial Resources ($'000)				
		Salaries	O&M	Grants & Contrib.	Capital	Total
Headquarters - PVM						
1.1 Canada-US & Interjurisdictional Water Management	2.80	117.80	33.75	-	-	151.55
1.3 Water Quality Management Data	13.25	552.30	98.62	-	56.00	706.92
1.6 Management & Adm	4.00	180.00	110.00	-	25.80	315.80
4.1 Toxic Chemicals	7.20	326.10	71.90	-	12.70	410.70
	-	-	(25.00)	-	-	(25.00)
4.2 L.R.T.A.P.	1.50	68.00	-	-	-	68.00
	-	-	(15.00)	-	-	(15.00)
Subtotal	28.75	1244.20	314.27	-	94.50	1652.97
	-	-	(40.00)	-	-	(40.00)
Headquarters - National Laboratory						
1.3 Water Quality Management Data	33.0	1024.00	359.26	-	294.52	1677.78
	-	-	(287.00)	-	-	(287.00)
4.1 Toxic Chemicals	9.0	279.00	106.00	-	-	385.00
	-	-	(78.25)	-	-	(78.25)
Subtotal	42.0	1303.00	465.26	-	294.52	2062.78
	-	-	(365.25)	-	-	(365.25)
Headquarters Total	70.75	2547.201	779.53	-	389.02	3715.75
	-	-	(405.25)	-	-	(405.25)
Atlantic						
1.1 Canada-US & Interjurisdictional Water Management	5.6	203.00	56.00	-	10.00	269.00
1.3 Water Quality Management Data	5.4	196.00	47.00	-	20.00	263.00
4.1 Toxic Chemicals	8.7	316.00	71.00	-	50.00	437.00
	(1.0)	(44.00)	(34.25)	-	(10.00)	(88.25)
4.2 L.R.T.A.P.	7.3	265.00	29.00	-	18.30	312.30
			(100.00)	-	(15.00)	(115.00)
	27.0	980.00	203.00	-	98.30	1281.30
	(1.0)	(44.00)	(134.25)	-	(25.00)	(203.25)
Quebec						
1.3 Water Quality Management Data	5.8	203.00	69.20	197.00	36.00	505.20
4.1 Toxic Chemicals	3.0	105.00	48.70	-	22.00	175.70
	-	-	(78.20)	-	-	(78.20)
4.2 L.R.T.A.P.	-	-	(10.00)	-	-	(10.00)
Total	8.8	308.00	117.90	197.00	58.00	680.90
	-	-	(88.20)	-	-	(88.20)

"( )" Represents additional non A-base Resources

Table 3 (cont'd) Water Quality Branch Summary of Resources
by Region for C&P National Programs - 1987-88 (estimated)

Region/C&P National Program		Person Years	Financial Resources ($'000) Salaries	O&M	Grants & Contrib.	Capital	Total
Ontario							
1.1 Canada-US & Interjurisdictional Water Management		4.45	205.63	47.80	-	15.70	269.13
		(0.40)	(14.00)	(20.00)	-	(10.00)	(44.00)
1.3 Water Quality Management Data		1.90	87.79	24.00	-	-	111.79
4.1 Toxic Chemicals		5.90	272.69	53.10	-	-	325.79
		(1.60)	(56.00)	(50.00)	-	(5.00)	(111.00)
	Total	12.25	566.11	124.90	-	15.70	706.71
		(2.00)	(70.00)	(70.00)	-	(15.00)	(155.00)
Western & Northern							
1.1 Canada-US & Interjurisdictional Water Management		9.53	344.10	105.30	-	34.40	483.80
1.3 Water Quality Management Data		13.33	521.80	262.20	-	85.70	869.70
		*(1.01)	(33.50)	(141.30)	-	(15.50)	(190.30)
4.1 Toxic Chemicals		3.18	120.40	110.80	-	8.10	239.30
		-	-	(28.80)	-	-	(28.80)
	Total	26.04	986.30	478.30	-	128.20	1592.80
		*(1.01)	(33.50)	(170.10)	-	(15.50)	(219.10)
Northwest Territories							
1.1 Canada-US & Interjurisdictional Water Management		0.26	10.50	5.20	-	0.40	16.10
1.3 Water Quality Management Data		0.82	31.20	97.00	-	1.90	130.10
4.1 Toxic Chemicals		0.32	12.90	6.90	-	0.50	20.30
4.3 Environ. Assessment & Baseline Studies		0.09	4.10	-	-	-	4.10
	Total	1.49	58.70	109.10	-	2.80	170.60
Pacific & Yukon							
1.1 Canada-US & Interjurisdictional Water Management		4.9	180.70	118.00	-	-	298.70
1.3 Water Quality Management Data		9.0	408.20	213.50	-	-	621.60
4.1 Toxic Chemicals		4.7	206.20	60.00	-	-	266.20
		(0.2)	(8.50)	(41.50)	-	-	(50.00)
	Total	18.6	795.00	391.50	-	-	1186.50
		(0.2)	(8.50)	(41.50)	-	-	(50.00)
W.Q.B.	TOTAL	164.93	6241.31	2204.23	197.00	692.02	9334.56
		(4.21)	(156.00)	(909.30)	-	(55.50)	(1120.80)

*( ) * Represents Additonal non A-base Resources * Saskatoon Lab. contract PY

Table 4
Water Quality Branch
Summary of Resources by C&P National Programs - 1987-88 (estimated)

C&P National Program	Person-Years No	%	Financial Resources ($'000) Salaries	O&M	Grants & Contrib.	Capital	Total	%
1.1 Canada-US and Interjurisdictional Water Management	27.54 (0.40)		1061.73 (14.00)	366.05 (20.00)	- -	60.50 (10.00)	1488.28 (44.00)	
1.3 Water Quality Management Data	82.50 (1.01)		3024.19 (33.50)	1170.78 (428.30)	197.00 -	494.12 (15.50)	4886.09 (477.30)	
1.6 Management & Administration	4.00		180.00	110.00	-	25.80	315.80	
4.1 Toxic Chemicals	42.00 (2.80)		1638.29 (108.50)	528.40 (336.00)	- -	93.30 (15.00)	2259.99 (459.50)	
4.2 L.R.T.A.P. (Long Range transport of Airborne Pollutants)	8.80 -		333.00 -	29.00 (125.00)	-	(18.30) (15.00)	380.30 (140.00)	
4.3 Environmental Assessment & Baseline Studies	0.09		4.10	-	-	-	4.10	
W.Q.B. TOTAL	164.93 (4.21)	100	6241.31 (156.00)	2204.23 (909.30)	197.00	692.02 (55.50)	9334.56 (1120.80)	100

"( )" Represents Additional non A-base Resources

Table 5
Water Quality Branch - 1987-88
Summary of Resources by C&P National Programs and Regions (estimated)

C&P National Program and Region	Person-Years No.	%	Financial Resources ($'000) Salaries	O&M	Grants & Contrib.	Capital	Total	%
1.1 Canada-US AND INTERJURISDICTIONAL WATER MANAGEMENT								
Headquarters	2.80	10.17	117.80	33.75	-	-	151.55	10.18
Atlantic	5.60	20.34	203.00	56.00	-	10.00	269.00	18.08
Quebec	-	-	-	-	-	-	-	-
Ontario	4.45	16.16	205.63	47.80	-	15.70	269.13	18.08
	(0.40)		(14.00)	(20.00)	-	(10.00)	(44.00)	
Western & Northern	9.53	34.60	344.10	105.30	-	34.40	483.80	32.51
N.W.T.	0.26	0.94	10.50	5.20	-	0.40	16.10	1.08
Pacific & Yukon	4.90	17.79	180.70	118.00	-	-	298.70	20.07
Total	27.54	100	1061.73	366.05	-	60.50	1488.28	100.00
	(0.40)		(14.00)	(20.00)	-	(10.00)	(44.00)	
1.3 WATER QUALITY MANAGEMENT DATA								
Headquarters	46.25	56.06	1576.30	457.88	-	350.52	2384.70	48.81
	-	-	-	(287.00)	-	-	(287.00)	
Atlantic	5.40	6.55	196.00	47.00	-	20.00	263.00	5.38
Quebec	5.80	7.03	203.00	69.20	197.00	36.00	505.20	10.34
Ontario	1.90	2.30	87.79	24.00	-	-	111.79	2.29
Western & Northern	13.33	16.16	521.80	262.20	-	85.70	869.70	17.80
	(1.01)		(33.50)	(141.30)	-	(15.50)	(190.30)	
N.W.T.	0.82	0.99	31.20	97.00	-	1.90	130.10	2.66
Pacific & Yukon	9.00	10.91	408.10	213.50	-	-	621.60	12.72
Total	82.50	100	3024.19	1170.78	197.00	494.12	4886.09	100
	(1.01)		(33.50)	(428.30)		(15.50)	(477.30)	
1.6 MANAGEMENT AND ADMINISTRATION								
Headquarters	4.0	100	180.00	110.00	-	25.80	315.80	100
Total	4.0	100	180.00	110.00	-	25.80	315.80	100

"( )" Represents Additional non A-base Resources

Table 5 continues on next page

Table 5 (cont'd)
Water Quality Branch - 1987-88
Summary of Resources by C&P National Programs and Regions (estimated)

C&P National Program and Region	Person-Years No.	%	Financial Resources ($'000) Salaries	O&M	Grants & Contrib.	Capital	Total	%
4.1 TOXIC CHEMICALS								
Headquarters	16.20	38.57	605.10	177.90	-	12.70	795.70	35.21
	-	-	-	(103.25)	-	-	(103.25)	
Atlantic	8.70	20.72	316.00	71.00	-	50.00	437.00	19.33
	(1.00)	-	(44.00)	(34.25)	-	(10.00)	(88.25)	
Quebec	3.00	7.14	105.00	48.70	-	22.00	175.70	7.77
	-	-	-	(78.20)	-	-	(78.20)	
Ontario	5.90	14.05	272.69	53.70	-	-	325.79	14.42
	(1.60)	-	(56.00)	(50.00)	-	(5.00)	(111.00)	
Western & Northern	3.18	7.57	120.40	110.80	-	8.10	239.30	10.59
	-	-	-	(28.80)	-	-	(28.80)	
N.W.T.	0.32	0.76	12.90	6.90	-	0.50	20.30	0.89
Pacific & Yukon	4.70	11.19	206.20	60.00	-	-	266.20	11.79
	(0.20)	-	(8.50)	(41.50)	-	-	(50.00)	
Total	42.00	100	1638.29	528.40	-	93.30	2259.99	100.00
	(2.80)		(108.50)	(336.00)	-	(15.00)	(459.50)	
4.2 L.R.T.A.P. (Long Range Transport of Airborne Pollutants)								
Headquarters	1.50	17.05	68.00	-	-	-	68.00	17.88
	-	-	-	(15.00)	-	-	(15.00)	
Atlantic	7.30	82.95	265.00	29.00	-	18.30	312.30	82.12
	-	-	-	(100.00)	-	(15.00)	(115.00)	
Quebec	-	-	-	(10.00)	-	-	(10.00)	
Total	8.80	100	333.00	29.00	-	18.30	380.30	
				(125.00)	-	(15.00)	(140.00)	100
4.3 ENVIRONMENTAL ASSESSMENT AND BASELINE STUDIES								
N.W.T.	0.09	100	4.10	-	-	-	4.10	100
Total	0.09	100	4.10	-	-	-	4.10	100
W.Q.B. TOTAL	164.93	100	6241.31	2204.23	197.00	692.02	9334.56	100
	(4.21)		(156.00)	(909.30)	-	(55.50)	(1120.80)	

"( )" Represents Additional non A-base Resources

D. PROJECT DESCRIPTIONS

Descriptions de projects

D.1 .ATLANTIC REGION

Région de l'Atlantique

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION ATL
PROJECT NO. WQB-1

PROJECT TITLE: International Saint John and St. Croix River

NATIONAL PROGRAM NAME: Can-US Interjurisdictional Water Management

C&P CODE: 1.1

DURATION: Ongoing

STUDY TEAM: WQB-AR

TEL: 857-6606

GOALS:
1. To assist Can-USA Committee on water quality in the Saint John River in reporting on present water quality & management strategi
2. To assist IJC Pollution Advisory Board on St. Croix River in monitoring water quality
3.

RATIONALE: Measure quality of interjurisdictional waters.

DESCRIPTION:

The surveillance for compliance with established water quality objectives on the Interjurisdictional Saint John River will be carried out by monitoring every six weeks for the listed parameters.

The surveillance of the International St. Croix River to meet the requirements of the IJC Pollution Advisory Board will be met by collecting grab samples for analysis for the listed parameters every six weeks. In addition the four parameters from the USGS automatic water quality monitor, hourly data, will be summarized monthly.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF	4.5		
TOTAL PY	4.5		
SALARIES	163.0		
O&M	48.0		
CONTRACTS			
CAPITAL	10.0		
TOTAL	221.0		

Map No.	NAQUADAT NO.	STATION LOCATION
1	00NB01AD0013	St. Francis River at picnic site
2	00NB01AD0017	Saint John River at Clair (GEMS station)
3	00NB01AD0016	Madawaska River below Fraser Mill outfall
4	00NB01AF0021	Green River at WSC Gauge
7	01NB01AF0005	Saint John River, above dam at Grand Falls
8	00NB01AG0003	Limestone Stream at Four Falls
9	01NB01AG0001	Aroostook River at Tinker Dam
10	00NB01AJ0012	Big Presquile Stream at Can/U.S. Border
11	00NB01AJ0029	Meduxnekeag River at Belleville
6	00NB01AF0038	Saint John River below Edmurdston
5	00NB01AD0003	Saint John River above Edmundston
12	00NB01AR0013	St. Croix River at Kellyland (Can. side)
13	00N501AR0014	St. Croix River at 200 m below Woodland Mill
17	00NB01AR0020	St. Croix River at Milltown (U.S. side)
18	00NB01AR0001	St. Croix River at Milltown (Can. side)
19	00NB01AR0021	St. Croix River at Milltown (Can. side)
14	00NB01AR0011	Grand Lake Outlet at Forest City
15	00NB01AR0002	St. Croix R. at St. Croix

Parameters

Field
- Temperature
- Dissolved Oxygen (Meter and Winkler)
- pH
- Specific Conductance

Laboratory
- pH
- Specific Conductance
- Colour
- Turbidity
- Total Alkalinity
- Calcium
- Magnesium
- Potassium
- Sodium
- Sulphate
- Cadmium - extractable
- Lead - extractable
- Copper - extractable
- Iron - extractable
- Mercury-extractable
- DOC
- Dissolved Inorganic Carbon
- Aluminum - extractable
- Total Suspendid Solids
- Total Phosphorus
- Nitrate & Nitrite
- Ammonia N
- Nitrogen - total

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-2

PROJECT TITLE: Water Quality Objectives & Guidelines

NATIONAL PROGRAM NAME:
Canada-US and Interjurisdictional Water Management

C&P CODE: 1.1

DURATION: On-going

STUDY TEAM: P. E. Belliveau **TEL:** 857-6606

GOALS:
1. Coordinate WQO activities on the St. John R. and chair ITAS*
2. Coordinate the development of WQO for basins in Nfld.
3. Promote use of WQO & Guidelines to OGDs.

RATIONALE:
Directly related to Branch mandate.

DESCRIPTION:

The long-term objective of this project is to promote the use of water quality objectives as a water quality management tool to all water resources managers and to provide assistance and direction in the development of these objectives.

* (ITAS) International Technical Advisory Subcommittee of the Canada-USA Committee on Water Quality of Saint John River.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF	1.1		
TOTAL PY	1.1		
SALARIES	40.0		
O&M	8.0		
CONTRACTS	-		
CAPITAL			
TOTAL	48.0		

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-3

PROJECT TITLE:
Negotiation and Coordination of Federal/Provincial Water Quality Agreements

NATIONAL PROGRAM NAME:
Water Management Data

C&P CODE: 1.3

DURATION: On-going

STUDY TEAM: P. E. Belliveau **TEL:** 857-6606

GOALS:
1. Coordinate the implementation of the Can/Nfld WQ Agreement
2. Complete the negotiations of the Can/N.B. WQ Agreement
3. Complete the negotiations of the Can/PEI WQ Agreement
4. Initiate the negotiations of the Can/NS WQ Agreement

RATIONALE:
Directly related to Branch mandate.

DESCRIPTION:

The long-term objective of this project is to negotiate and coordinate Federal/Provincial Water Quality Agreements with each Province in the Atlantic Region.

A-BASE RESOURCES: ($'000)	Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF	1.6		
TOTAL PY	1.6		
SALARIES	58.0		
O&M	15.0		
CONTRACTS	-		
CAPITAL	-		
TOTAL	73.0		

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-4

PROJECT TITLE: F/P Agreement Assessment

NATIONAL PROGRAM NAME: Water Quality Management Data **C&P CODE:** 1.3

DURATION: On-going

STUDY TEAM: WQB-AR P. Belliveau **TEL:** 857-6606

GOALS:
1. Sign F/P water quality agreement with N.B. and initiate.
2. Continue monitoring network in Newfoundland and initiate basin survey sampling.
3.

RATIONALE: Increase environmental quality data base through joint federal-provincial water quality programs.

DESCRIPTION:

Continue the monitoring network of federal, federal/provincial and provincial stations in Newfoundland plus initiate a basin study on the island. The latter to be carried out by federal personnel with provincial input.

Negotiations with N. B. to continue with a projected agreement signing this fiscal year.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	1.1		
PROF			
TOTAL PY	1.1		
SALARIES	40.0		
O&M	11.0		
CONTRACTS			
CAPITAL	10.0		
TOTAL	61.0		

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-5

PROJECT TITLE: EDP Processing & Servicing

NATIONAL PROGRAM NAME:
Water Management Data

C&P CODE: 1.3

DURATION:

STUDY TEAM: R. A. Bingham **TEL:** 857-6606

GOALS: 1. Provide Regional EDP service for various Directorate projects.

2.

3.

RATIONALE: Regional managers require data in a format which can be readily managed, manipulated and interpreted. Data is digitally stored with software & hardware provided for interpretive officers to work with.
DESCRIPTION:

Provide regional electronic data processing service.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	1.4		
PROF			
TOTAL PY	1.4		
SALARIES	51.0		
O&M	15.0		
CONTRACTS			
CAPITAL	10.0		
TOTAL	76.0		

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-6

PROJECT TITLE: Regional Overview Network

NATIONAL PROGRAM NAME:
Water Quality Management Data

C&P CODE: 1.3

DURATION: Until F/P Agreements are signed with each Atlantic Province

STUDY TEAM: T. L. Pollock **TEL:** 857-6606

GOALS:
1. To coordinate the collection of bi-monthly ambient water quality data by the Water Resources Brnch at 27 stations in
2. Atlantic Canada comprising the Regional Overview Network.
3.

RATIONALE: Collection of water samples from 27 strategically located stations will provide an overview of water quality in the Atlantic Regior

DESCRIPTION:

This project will consist of collecting water samples every two months from 27 geographically strategic locations in the Atlantic Region and to have these samples analyzed for major ions, trace metals, nutrients plus any parameters of special concern during the sampling period. All samples will be collected by WRB technicians while coordination and logistic support will be handled by the WQB. Supplies in the form of sampling kits will be shipped from Moncton to the WRB district offices on the last day of the month preceeding the month samples are to be collected.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF	0.6		
TOTAL PY	0.6		
SALARIES	22.0		
O&M	3.0		
CONTRACTS			
CAPITAL	-		
TOTAL	25.0		

Map No.	NAQUADAT NO.	Station Location
7	01NB01AF0005	St. John River at Grand Falls Headpond approx. 150 m. above dam.
11	00NB01AJ0029	Meduxnekeag River at Bridge above junction with Mill Stream, Belleville, N.B.
28	00NB01AP0002	Kennebecasis River at Hwy 880 Bridge, Apohaqui, N.B.
18	00NB01AR0001	St. Croix River at International Bridge, Milltown, N.B.
29	00NB01BJ0056	Restigouche River at Rafting Ground Brook, N.B.
30	00NB01BK0026	Nepisiquit River at Hwy 360, N.B.
31	00NB01B00001	S.W. Miramichi River at Bridge, Blackville, N.B.
32	00NB02BQ0044	N.W. Miramichi River at Hwy 430 Bridge, Wayerton, N.B.
33	00NB01BU0031	Petitcodiac River at TCH Bridge, Petitcodiac, N.B.
23	00NS01DC0001	Annapolis River at Bridge, Wilmot Station, N.S.
34	00NS01DG0008	Shubenacadie River at Bridge, Elmsdale, N.S.
35	00NS01DN0001	Wallace River at TCH Bridge, Wentworth Centre, N.S.
36	00NS01EE0001	Medway River at Bridge, Charleston, N.S.
37	00NS01F00005	St. Mary's River at Hwy 7 Bridge, Stillwater, N.S.
38	00NS01FB0001	N.E. Margaree River at Bridge, Margaree Valley, N.S.
39	00NS01FJ0001	Salmon River at Salmon River Bridge, N.S.
40	00PE01CA0001	Carruthers Brook at Bloomfield Park North of St. Anthony, PEI

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-7

PROJECT TITLE:
Sediment Laboratory in Support of Water Resource Branch

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION: On-going

STUDY TEAM: Water Resource Branch TEL: 1-902-426-5776

GOALS: 1. Provide physical sedimentation determinations on water samples submitted by WRB.
2.
3.

RATIONALE: To meet Goals and Objectives of WRB.

DESCRIPTION:

WRB submit water samples for physical sediment determination from a network of stations throughout Atlantic Canada.

The sediment results are utilized by WRB.

This activity is a provision of a service to WRB, the analytical results are not used by WQB.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	0.7		
PROF			
TOTAL PY	0.7		
SALARIES	25.0		
O&M	3.0		
CONTRACTS	-		
CAPITAL			
TOTAL	28.0		

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-8

PROJECT TITLE: Radioisotope Sample Collection

NATIONAL PROGRAM NAME: Toxic Chemicals **C&P CODE:** 4.1

DURATION: On-going

STUDY TEAM: WQB-AR **TEL:** 857-6606

GOALS: 1. To provide water samples in support of the national radioisotope monitoring program of WQB designed to
2. provide background information.
3.

RATIONALE: To establish background radioisotope levels prior to establishment of nuclear power plants or exploitation of natural resources which release radioisotopes.

DESCRIPTION:

Monthly water samples are collected from 6 sites in the Atlantic Region; aliquots of the samples are pooled annually and forwarded to CCIW for analysis.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	0.1		
PROF			
TOTAL PY	0.1		
SALARIES	4.0		
O&M	1.0		
CONTRACTS	-		
CAPITAL			
TOTAL	5.0		

National Radioisotope Monitoring Program

MAP NO.	NAQUADAT NO.	SAMPLER	STATION LOCATION
21	02NB01AQ0001	WRB	Moose Creek at Hwy 790 Bridge near Change Harbour, St. John County, N.B.
22	02NB01BU0002	WQB	Peticodiac River at Gunningsville Bridge, Moncton, N.B.
12	00NB01AR0013	WRB	St. Croix R. at Kellyland
23	00NS01DC0001	WRB	Annapolis River at Bridge, Wilmot, N.S.
24	00NS01FJ0020	WRB	McAskill brook at Hwy Bridge on road to Birch Grove near Glace Bay
25	00NF03NG0004	Contractor	Ranger Bight Brook outlet at Ranger Bight, 2 km West of Makkovik, Labrador

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-9

PROJECT TITLE: Toxic Chemical Survey of Atlantic Region Drinking Water Sources

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

DURATION: 3rd year of 4 year study

STUDY TEAM: WQB-AR

TEL: 857-6606

GOALS:
1. Measure toxic chemical residue levels in raw water used as drinking water sources at 10 sites in each of the four Atlantic Provinces.
2. Compare volatile organic compound concentrations in raw water with those in treated water as measured by NH&W.
3. Prepare interim report on first two years of study in each of the four provinces.

RATIONALE: Measurement of toxics in the environment for management purposes.

DESCRIPTION:

Samples of raw water will be collected from 10 sites in each of the four provinces. At the same time treated water samples will be collected for submission to Health and Welfare Canada for the analysis of volatile organic compounds.

An interim report on results from the first two years of the study will be prepared for each of the provinces.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF	4.1		
TOTAL PY	4.1		
SALARIES	149.0		
O&M	33.0		
CONTRACTS			
CAPITAL	20.0		
TOTAL	202.0		

Water sources serving the following Municipalities to be sampled in 1987/88.

Newfoundland

(1) Hermitage
(2) Morrisville
(3) Grand Falls - Bishop Falls
(4) Springdale
(5) Shoe Cove
(6) Baie Verte
(7) Sop's Arm
(8) Buchans
(9) Deer Lake
(10) Burgeo

Nova Scotia

Tatamagouche
New Glasgow
Antigonish
St. Peters
Glace Bay
North Sydney
Baddeck
Inverness
Mabou
Judique

New Brunswick

Fredericton - Wilmot #3
Fredericton - Wilmot #5
Fredericton - Maple #1
Fredericton - Cliff
Rothesay
Sussex
Hartland
Grand Falls
St. Jacques
Kedgwick

Prince Edward Island

Parkdale - Well #3
Charlottetown - Main Malpeque
Charlottetown - Brackley #12
Charlottetown - Union "A"
Souris - 2nd Park Well
North Rustico
Kensington
St. Eleanors - Well #3
Summerside - Well #6
Summerside - Well #7

Parameters

The following is a list of Chemical Parameters for the 1987/88 study:

PARAMETER	NAQUADAT No.
Physical Determinations	
Colour	02011
Specific Conductance	02041
Turbidity	02073
pH	10301
Major Ions & Other Tests	
Alkalinity - Total	10101
Calcium	20110
Magnesium	12107
Sodium	11103
Potassium	19103
Chloride (s.i.e.)	17205

Sulfate-Colour, or (I.C.)	16304 (16309)
Nitrate-Nitrite	07110
Diss. Organic Carbon	06107
Silica	14102
Humic Substances	06581
Fluoride	09105
Metals - Total Extractable	
Aluminum (S.E.)	13305
Chromium (D.A.)	24302
Manganese (D.A.)	25304
Iron (S.E.)	26305
Nickel (S.E.)	28302
Copper (S.E.)	29305
Zinc (D.A.)	30304
Arsenic - Total (Hydride A.A.S.)	33007
Cadmium (S.E.)	48302
Mercury - Total	80315
Lead (S.E.)	82302

Organochlorine Pesticides & PCB's

* p,p'-DDT	18000
* o,p'-DDT	18005
* p,p'-DDD	18010
* p,p'-DDE	18020
* p,p'-Methoxychlor	18030
* Heptachlor	18040
* Heptachlor epoxide	18045
-Endosulphan	18050
-Endosulphan	18055
* -Chlordane	18060
* -Chlordane	18065
* Lindane	18070
-BHC	18075
Mirex	18125
* Aldrin	18130
# Endrin	18140
* Dieldrin	18150
Arochlor Total	18164

Chlorinated Benzenes

1,3-Dichlorobenzene	17820
1,4- "	17821
1,2- "	17822
1,3,5-Trichlorobenzene	17830
1,2,4- "	17831
1,2,3- "	17832
1,2,3,5-Tetrachlorobenzene	17840
1,2,4,5- "	17841
1,2,3,4- "	17842
Pentachlorobenzene	17850
Hexachlorobenzene	17812

Polyaromatic Hydrocarbons	
Fluoranthene	18904
Benz(b) Fluoranthene	18901
Benz(k) Fluoranthene	18903
Benz(a) Pyrene	18900
Indeno (1,2,3,cd) Pyrene	18905
Benzo (g,h,i) Perylene	18902
Organophosphate Pesticides	
Azinphosethyl	18195
Azinphosmethyl	18190
Carbophenothion	18320
Crufomate	18320
* Diazinon	18270
Disulfoton	18215
Ethion	18310
Fenitrothion	18330
Imidan	18205
Malathion	18250
* Methyl parathion	18245
Methyl Trithion	18325
* Parathion	18240
Phorate	18300
Ronnel	18260
Chlorinated Phenols	
2,6-Dichlorophenol	-
2,5- "	-
2,4- "	-
3,5- "	-
2,3- "	-
3,4- "	-
2,4,6-Trichlorophenol	-
2,3,6- "	-
2,3,5- "	-
2,3,4- "	-
3,4,5- "	-
2,3,5,6-Tetrachlorophenol	-
2,3,4,6- "	-
2,3,4,5- "	-
Pentachlorophenol	-
Carbamate Pesticides	
Aldicarb	-
* Carbaryl	-

N.B.: Those compounds flagged by an asterisk (*) have acceptable maximum concentrations listed in the 1978 edition of "Canadian Drinking Water Quality Guidelines".

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-10

PROJECT TITLE: Integrated Tile Drainage Pesticide Study

NATIONAL PROGRAM NAME: Toxic Chemicals **C&P CODE:** 4.1

DURATION: Two years

STUDY TEAM: WQB-AR, Ag Can, Ag N.B. **TEL:** 857-6606

GOALS:
1. Measure pesticide residues in tile drainage effluent in an intensively farmed area of N.B. Attempt to quantify loss via this route.
2. Relate to nutrient losses from same fields being measured simultaneously by Ag Can.
3. Qualitatively study primary producers in standing water at tile outfall to see effect of residual pesticides.

RATIONALE: Contribute to management strategies for pesticide use in a maritime climate on soils suitable for potatoes and grain.

DESCRIPTION:

Samples will be collected from gauged outfalls before and after application of herbicides, insecticides and fungicides on potato fields and before and after herbicide treatment of grain fields. The sampling will be done on an event basis by a combination of lay collectors (4 hour intervals while drains are flowing) and Branch personnel (sampling on a geometric progression during an event).

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	3.5	1.0	
PROF			
TOTAL PY	3.5	1.0	4.5
SALARIES	127.0	44.0	171.0
O&M	27.0	34.25	61.25
CONTRACTS	-	10.0	10.0
CAPITAL	30.0	-	30.0
TOTAL	184.0	88.25	272.25

Station Nos	
13NB01AF0001	Drainage tile outfall - M. Ouellette St. André
13NB01AF0002	Drainage outfall - L. Rideout, Grand Falls Portage
13NB01AF0003	Drainage tile outfall - H. Pedersen, New Denmark Corner
13NB01AG0001	Drainage tile outfall - J. Shorey, Gillespie Sett.
13NB01AJ0001	Drainage tile outfall - J. Banks, Florenceville

Parameters	Frequency
dinoseb	22
metribuzin	90
MCPA	50
deltamethrin	40
fenvalerate	50
chlorothalonil	75
major ions	150

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-11

PROJECT TITLE: Aldicarb Study by NWRI on P.E.I.

NATIONAL PROGRAM NAME: Toxic Chemicals **C&P CODE:** 4.1

DURATION: Two years

STUDY TEAM: R. Jackson, NWRI, WQB-AR **TEL:** 857-6606

GOALS:
1. Determine seasonal major ion and nutrients concentrations in groundwater from observation piezometers.
2. Determine aldicarb, aldicarb sulfone and aldicarb sulfoxide concentrations in selected groundwater samples during NWRI's
3. field season.

RATIONALE: Determination of aldicarb decomposition pathways in groundwater in a maritime climate under intensive agricultural conditions.

DESCRIPTION:

Groundwater from observation wells in a P.E.I. potato field will be analyzed for major ions and nutrients on a seasonal basis. In addition selected samples will be analyzed for aldicarb, aldicarb sulfone and aldicarb sulfoxide in support of the NWRI field program on the Island.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF	0.7		
TOTAL PY	0.7		
SALARIES	25.0		
O&M	7.0		
CONTRACTS	-		
CAPITAL	-		
TOTAL	32.0		

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-12

PROJECT TITLE: Organics in Precipitation

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

DURATION: On-going

STUDY TEAM:

TEL:

GOALS: 1. Obtain data on quantity of selected toxic organic compounds to the Inland Waters of Atlantic Region.

2.

3.

RATIONALE: This is the only on-going sampling of toxic chemicals in rain rain from LRTAP.

DESCRIPTION:

Collection of precipitation samples from 3 sites; 2 in Nova Scotia and 1 in Prince Edward Island, on a monthly basis for organic contaminant analysis.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF	0.3		
TOTAL PY	0.3		
SALARIES	11.0		
O&M	3.0		
CONTRACTS	-		
CAPITAL			
TOTAL	14.0		

MAP NO.	NAQUADAT NO.	STATION LOCATION
77	33NS01DN0001	Jackson, Nova Scotia
78	33NS01ED0004	Kejimkujik National Park, N.S.
79	33PE01CA0001	Ellerslie Biological Station, P.E.I.

Parameters	Frequency
OC, PCB	Monthly
Chlorobenzenes	Monthly
PAH	Monthly

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-13

PROJECT TITLE: Kejimkujik Basin Studies

NATIONAL PROGRAM NAME: LRTAP

C&P CODE: 4.2

DURATION: Three years

STUDY TEAM: WQB-AR

TEL: 857-6606

GOALS:
1. Link basin processes to water quality through study of temporal and spatial variabilities.
2. Describe snow and snow melt chemistry.
3. Define relationship between aluminum, organic acids, mineral acids and impacts on life cycle of fish.

RATIONALE: Acquire an understanding of effects of mineral and organic acids on aquatic systems, (lakes, streams, wetlands) in the Region.

DESCRIPTION:

Interpret data from weekly sampling of headwater streams variously draining lakes, wetlands and uplands only using various graphical and statistical techniques.

Interpret snow pack/snowmelt chemistry under the maritime conditions in the Basin which in the three years studied have varied from snow pack duration of two weeks to two months.

Participate in characterization of aluminum species, organic fractions and fish bioassay study using natural waters from coloured and clear lakes and streams in the Basin by doing water and fish tissue analyses.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	2.1		
PROF			
TOTAL PY	2.1	-	2.1
SALARIES	76.0	-	76.0
O&M	9.0	35.0	44.0
CONTRACTS	10.0	10.0	20.0
CAPITAL			
TOTAL	95.0	45.0	140.0

Monitoring Sites (WQB)

00NS01ED0005	Mersey River
00NS01ED0030	Rogers Brook
00NS01EE0014	Moose Pit Brook
00NS01EE0015	Whiteburn Brook

Monitoring Sites (CWS)

00NS01ED0001	Mersey R. at Outlet George L.
00NS01ED0018	West R.
00NS01ED0019	Little R.
00NS01ED0022	Pebbleloggitch L. outflow
00NS01ED0023	Beaverskin L. outflow
00NS01ED0024	Grafton Brook
00NS01ED0026	Atkins Brook
00NS01ED0027	Mt. Thom. Brook
01NS01ED0007	Kejimkujik L.
01NS01ED0010	Pebbleloggitch L.
01NS01ED0027	Beaverskin L.

Parameters

Parameter list for LRTAP Monitoring Sites. Table (1)

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-14

PROJECT TITLE: LRTAP Stream Monitoring

NATIONAL PROGRAM NAME: LRTAP

C&P CODE: 4.2

DURATION: On-going

STUDY TEAM: WQB-AR

TEL: 857-6606

GOALS: 1. Monitor quality of stream water on monthly basis in an area sensitive to acidification.

2.

3.

RATIONALE: Provide continuous record of stream water quality for documenting effects of acid rain control strategies.

DESCRIPTION:

Twenty-seven streams in the Region are sampled on a monthly basis. These streams are located in areas within the Region which are sensitive to acidification from acid rain depositions.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	3.6		
PROF			
TOTAL PY	3.6	-	3.6
SALARIES	131.0	-	131.0
O&M	10.0	30.0	40.0
CONTRACTS	-	-	-
CAPITAL	8.3	5.0	13.3
TOTAL	149.3	35.0	184.3

Map. No.	NAQUADAT No.	Station Location
		Nova Scotia
36	00NS01EE0001	Medway River
62	00NS01EC0005	Roseway River
63	00NS01EA0001	Tusket River
64	00NS01EN0002	Liscomb River
65	00NS01EF0002	Lahave River
37	00NS01EØ0001	St. Mary's River
66	00NS01DE0001	Avon River at Power Dam
67	00NS01DL0009	Kelley River
35	00NS01DN0001	Wallace River
68	00NS01DA0001	Meteghan River
69	00NS01ER0001	Clam Harbour River
60	00NS01ED0005	Mersey River
		New Brunnswick
70	00NB01AQ0001	Lepreau River
71	00NB01BV0015	Ponte Wolfe River
72	00NB01AN0001	Salmon River at Gaspereau Forks
73	00NB01AM0001	North Branch Oromocto River
		Newfoundland and Labrador
74	00NF02ZB0001	Isle aux Morts River
43	00NF02YC0001	Torrent River @ Bristol's Pool
44	00NF02YJ0001	Harry's River @ Black Duck
45	00NF02ZH0001	Piper's Hole River @ Mother's Brook
46	00NF92ZK0001	Rocky River @ Colinet
47	00NF02YØ0001	Exploits River @ Grand Falls
48	00NF02YM0001	Indian Brook @ Springdale
51	00NF02ZG0016	Garnish River
		Prince Edward Island
49	00PE01CA0001	Mill River
50	00PE01CB0001	Dunk River

TABLE (1)

Parameter List for LRTAP monitoring sites in the Atlantic Region

Field

Water Temperature
pH
Instantaneous or Mean daily discharge (Rivers only)
Specific Conductance

Laboratory

Colour (Nessler relative units)
Conductivity ($uS.cm^{-1}$)
pH
Turbidity (JTU's)
Alkalinity (Gran and/or Total - depending on pH)
Sulfate (MTB, $mg.L^{-1}$)
Sulfate (Ion Chromatograph, $mg.L^{-1}$)
Chloride
Fluoride
Calcium
Magnesium
Potassium
Sodium
Silica (Reactive)
Iron (Extractable)
Manganese (Extractable)
* Copper (Extractable)
* Zinc (Extractable)
* Cadmium (Extractable)
* Lead (Extractable)
Aluminum (Extractable)
Carbon (Dissolved organic)
Nitrogen (Total)
Nitrate-Nitrite
Humic Acids (Fluorometry)
Total Phosphorus

* Analysis for these metals not done for (c) Monitoring Sites (WQB)

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION Atlantic
PROJECT NO. WQB-15

PROJECT TITLE: LRTAP Lake Monitoring

NATIONAL PROGRAM NAME: LRTAP **C&P CODE:** 4.2

DURATION: On-going

STUDY TEAM: WQB-AR **TEL:** 857-6606

GOALS:
1. Monitor water quality of headwater lakes susceptible in varying degrees to acidification at spring and fall overturn.
2. In concert with DFO biological monitoring relate water quality to biological productivity and/or diversity.
3.

RATIONALE: Document effects of LRTAP on water quality and aquatic communities for water managers and bilateral negotiators.

DESCRIPTION:

Forty-four lakes in southwestern Nova Scotia and thirty-four lakes in Newfoundland are sampled after the vernal and autumnal overturns under well mixed conditions. All DFO LRTAP biological monitoring lakes in the Region have been incorporated in WQB's sampling program.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	1.6		
PROF			
TOTAL PY	1.6	-	1.6
SALARIES	58.0	-	58.0
O&M	10.0	35.0	45.0
CONTRACTS	-	-	-
CAPITAL	-	-	-
TOTAL	68.0	35.0	103.0

Map No.	NAQUADAT No.	Station Location
		Acid Precipitation Lake Sampling in Southwestern Nova Scotia
121	01NS01ED0001	Back Lake in middle
122	01NS01ED0002	Big Dam West Lake in middle
123	01NS01ED0003	Big Dam East Lake in middle
124	01NS01ED0004	Mountain Lake in centre of north part
125	01NS01ED0005	Peskowesk Lake N.W. of tip of Isle de l'Original
126	01NS01ED0006	Grafton Lake in centre
127	01NS01ED0007	Kejumkujik Lake 200 m. S.W. of Peale Island
128	01NS01ED0008	High Lake in middle
129	01NS01ED0010	Pebbleloggitch Lake in middle
130	01NS01ED0011	Coblielle Lake in middle
131	01NS01ED0013	Ben Lake in middle
132	01NS01ED0014	Big Red Lake
133	01NS01ED0015	Mud Lake in middle
134	01NS01ED0016	Snake Lake in middle
135	01NS01ED0017	Liberty Lake in middle
136	01NS01ED0019	Frozen Ocean Lake in middle
137	01NS01ED0020	Central Lake
138	01NS01ED0021	Little Red Lake at S.E. side
139	01NS01ED0022	Poplar Lake in middle
140	01NS01ED0025	Luxion Lake in middle
141	01NS01ED0027	Beaverskin Lake in middle of west part
142	01NS01ED0028	McGinty Lake in middle
143	01NS01ED0029	Peskawa Lake in middle
144	01NS01ED0030	Upper Silver Lake in middle of South basin
145	01NS01ED0043	Mount Tom lake - Kej. Nat'l Park
146	01NS01ED0047	George Lake - Kej. Nat'l Park
147	01NS01ED0048	Loon Lake - Kejimkujik Nat. Park
148	01NS01EA0010	Trefry Lake 300 m N.N.E. of outlet
149	01NS01EA0011	Allens Lake
150	01NS01EA0013	Milton Lake just North of centre
151	01NS01EA0014	Churchill Lake about 300 m. S.W. of inlet
152	01NS01EA0016	Darling lake 300m S. of inlet from Coggins Lake
153	01NS01EA0002	Lake George, 15 km N.E. of Yarmouth (water supply)
154	01NS01EA0004	Jesse Lake, Yarmouth Co.
155	01NS01EA0005	Doctor Lake 300 m S.W. of large island
156	01NS01EA0009	Brenton Lake near centre
157	01NS01DA0002	Tedford Lake, Digby Co.
158	01NS01DA0003	Killam Lake 250 m. N.W. of inlet from Lake George
159	01NS01DA0004	Cedar lake 100 mg. S.W. of large point at N. end
160	01NS01DA0005	Lower Corning lake 550 m S.E. of Corning Brook
161	01NS01DA0006	Pierce Lake 175 m. W. of N.E. Shore
162	01NS01DA0007	Coggins Lake about 300 m. N. of Southern Shore
163	01NS01EA0019	Snarl Lake 440 m. N.E. of N.W. outlet
164	01NS01EA0020	Bird lake about 200 m. E. of N.W. Shore

Map. No.	NAQUADAT No.	Station Location
		Acid Precipitation Sampling in Newfoundland
87	01NF02YH0001	Wigwam Pd
88	01NF02YK0006	Center of Glover Island
89	01NF02YM0001	East of Adies Pd
90	01NF02YM0001	Near Noble Pd
91	01NF02YM0003	North of Upper Indian Pd
92	01NF02YM0006	Near Middle Arm
93	01NF02YM0007	N.W. of Burlington
94	01NF02YN0008	Sandy Lake S.W. of Buchans
95	01NF02Y00007	Gull Lake
96	01NF02Y0009	Tally Pond
97	01NF02YQ0001	Bellman's pd
98	01NF02YR0005	Near Ocean Pd and T.M. Pd
99	01NF02YS0003	Rattle Pd
100	01NF02YS0005	Shallow Pd #3
101	01NF02YS0009	Ochre Hill Pd
102	01NF02YS0010	Chatman Pd W.
103	01NF02YS0016	Nameless Pd #2
104	01NF02YS0021	Bog Pd
105	01NF02YS0029	Long Waters S.
106	01NF02YS0045	Jay Pond
107	01NF02YS0048	Mosses Cove Pd
108	01NF02ZB0001	Big Pond
109	01NF02ZC0002	Near Knowle's Bk
110	01NF02ZC0003	Stephenson's Pd
111	01NF02ZD0001	Near Dolland Bk
112	01NF02ZD0002	Pd W. of Wolf Lake
113	01NF02ZF0003	Pd N. of Gisbourne L.
114	01NF02ZF0004	Hungry Grove Pd
115	01NF02YH0011	Unnamed Pd. Gros Morne at Nat. Park
116	01NF02YH0012	Unnamed Pd. Gros Morne at Nat. Park
117	01NF02YH0013	Unnamed Pd. Gros Morne at Nat. Park
118	01NF02YH0014	Unnamed Pd. Gros Morne at Nat. Park
119	01NF02YL0015	Unnamed Pd. Gros Morne at Nat. Park
120	01NF02YH0010	Unnamed Pd. Gros Morne at Nat. Park

Water Quality Branch Parameter List for the Acid
Precipitation monitoring sites in the Atlantic Region

Field

Water Temperature
pH
Instantaneous or Mean daily discharge (Rivers only)
Specific Conductance

Laboratory

Colour (Nessler relative units)
Conductivity (uS. cm^{-1})
pH
Turbidity (JTU'S)
Alkalinity (Gran and/or Total-depending on pH))
Sulfate (MIB, $mg.L^{-1}$)
Sulfate (Ion Chromatograph, $mg.L^{-1}$)
Chloride
Fluoride
Calcium
Magnesium
Potassium
Sodium
Silica (Reactive)
Iron (Extractable)
Manganese (Exractable)
Copper (Extractable)
Zinc (Extractable)
Cadmium (Extractable)
Lead (Extractable)
Aluminum (Extractable)
Carbon (Dissolved organic)
Nitrogen (Total)
Nitrate-Nitrite
Humic Acids (Fluorometry)
Total Phosposrus

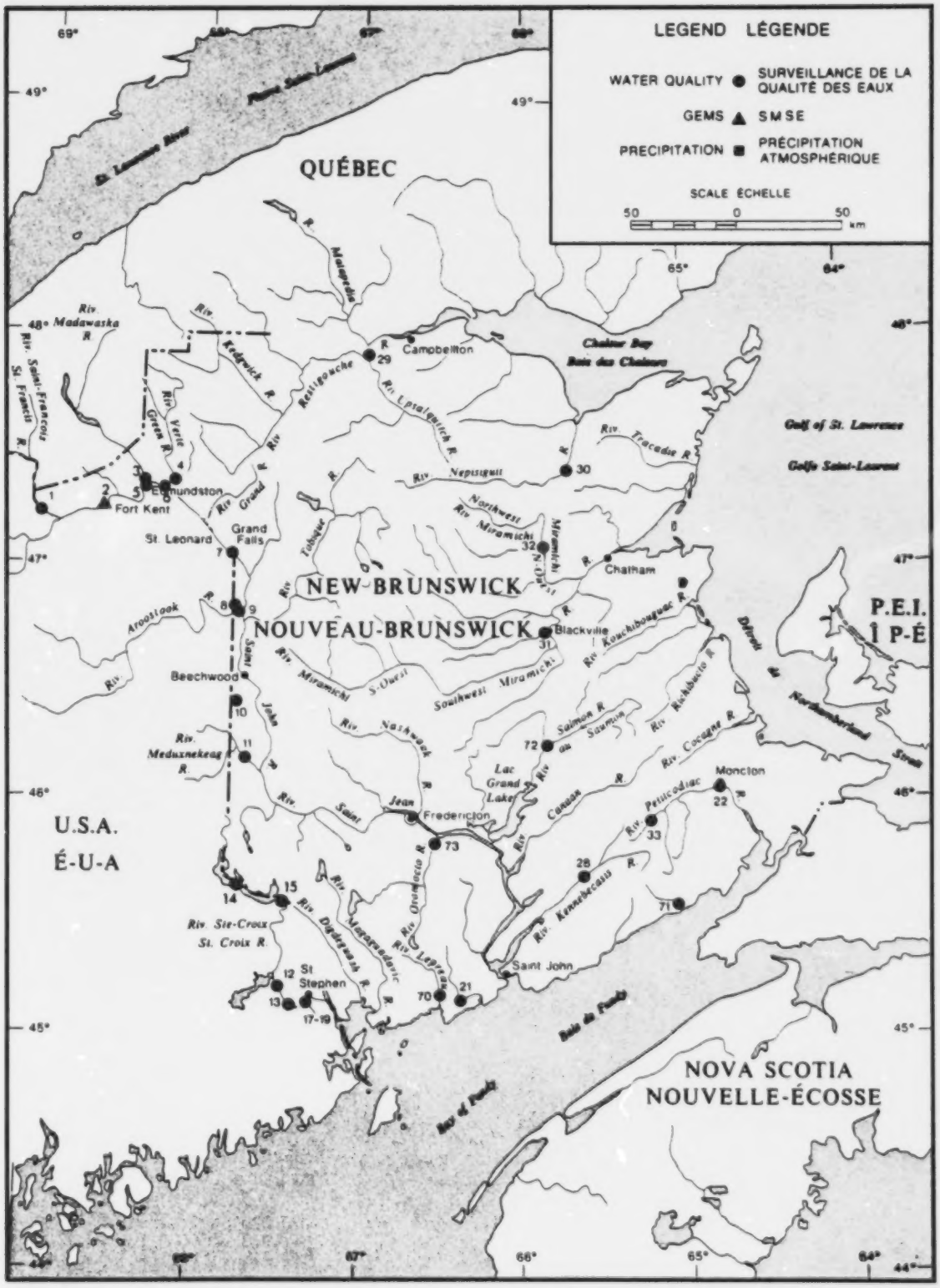


FIGURE 1 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

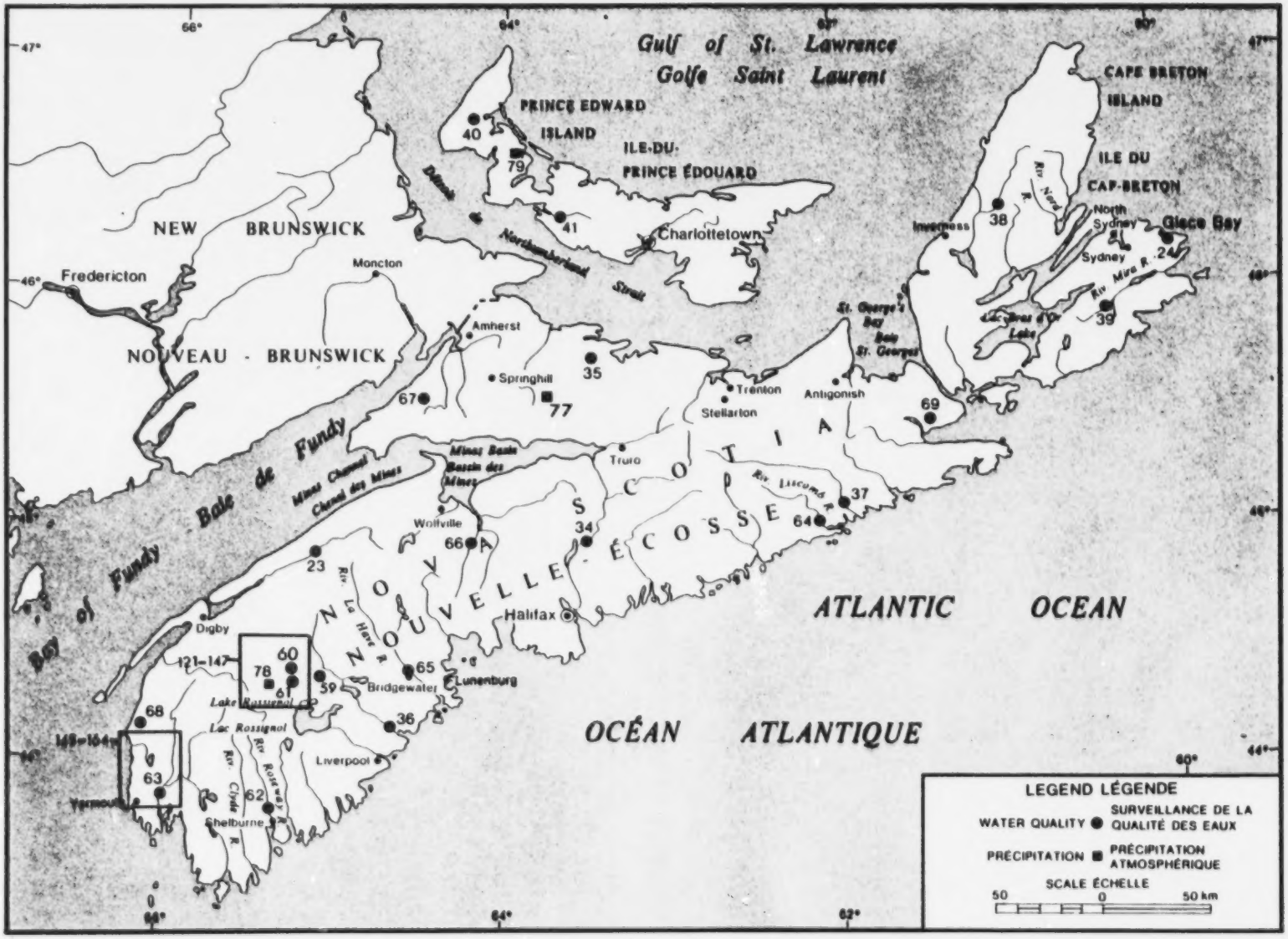


FIGURE 2 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

FIGURE 3 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

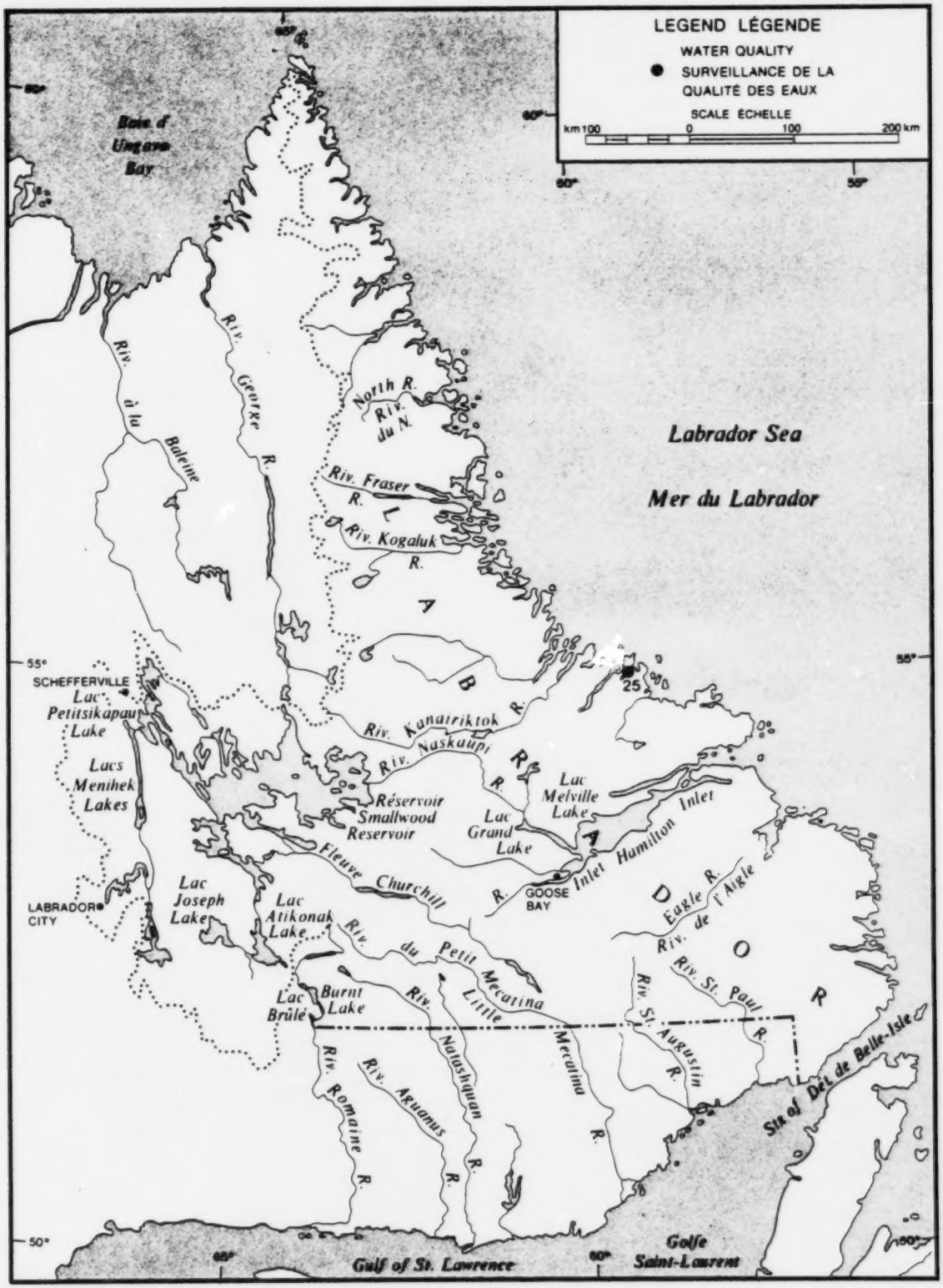


FIGURE 4 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

D.2 QUEBEC REGION

Région du Québec

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1987/1988

REGION Québec
NUMERO DU PROJET 1

TITRE DU PROJET: Entente Canada/Québec sur la qualité de l'eau

DUREE: En cours.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau. CODE DU C&P 1.3

EQUIPE D'ETUDE: Division Entente et Monitorage (514) 646-6043

BUTS: Mise en oeuvre et administration de l'entente CANADA/QUEBEC sur la surveillance continue de la qualité du milieu aquatique.

FONDEMENTS: L'entente sur la qualité de l'eau prévoit la concertation entre les deux gouvernements dans la surveillance de la qualité du milieu aquatique.
En 1985/86, les deux parties ont procédé à une renégociation de l'entente sur la qualité de l'eau. Trois programmes conjoints ont été élaborés: un sur les précipitations acides, un sur les substances toxiques et un sur la qualité de l'eau. En 1987/88, les stations fédérales-provinciales sont demeurées inchangées pour le programme Qualité de l'eau, et elles sont à définir pour les 2 autres programmes.

DESCRIPTION DU PROJET:

1) Participer aux réunions du comité de coordination de l'entente (minimum 3 réunions par année).

2) Assurer le secrétariat du comité de coordination de l'entente et rédiger un rapport annuel pour le 30 septembre 1987.

3) Assurer l'échange avec la province des résultats d'échantillonnage faisant partie de l'entente (à réaliser conjointement avec l'administration centrale).

4) Assurer avec la province un contrôle de qualité au niveau des analyses en laboratoire (contrôle inter-laboratoire fédéral-provincial).

	RESSOURCES DES SERVICES VOTES:	RESSOURCES EXTERIEURES AUX SERVICES VOTES:	
	(MILLIERS DE DOLLARS)		
	Sous-total	Sous-total	Total
A-P TECH.			
A-P PROF.			
TOTAL DES A-P	1,0	---	1,0
TRAITEMENTS	35,00	---	35,00
FONCTIONNEMENT ET ENTRETIEN	7,00		7,00
SUBVENTION	197,00		197,00
IMMOBILISATIONS	---		---
TOTAL	239,00		239,00

LISTE DES STATIONS

a) Suivi d'intervention (provincial)

Liste non disponible pour l'instant

b) Réseau-lacs, précipitations acides (fédéral-provincial)

Liste non disponible pour l'instant

c) Substances toxiques

Liste non disponible pour l'instant

LISTE DES STATIONS

c) Réseau-rivières (fédérales-provinciales):

NUMÉRO NAQUADAT	NUMÉRO BQMA	DESCRIPTION	ZONE	COORDONNÉES UTM EST	COORDONNÉES UTM NORD
	01150003	Matapédia au pont Mercier à Matapédia	19	653200	5315300
	01150004	Matapédia au pont-route à 2,0km en amont du lac au Saumon	19	621150	5366100
	01170001	Madawaska au pont-route à Dégelis	19	527250	5266200
	02340006	Chaudière au pont en amont de la Drolet au sud-ouest de Saint-Ludger	19	360900	5061050
	02340033	Chaudière à la prise d'eau de Charny	19	325900	5174200
	02400004*	Bécancour au pont-route 132 à Bécancour	18	697000	5136200
	03010008*	Nicolet au pont-route 226 à Ste-Monique	18	690100	5113900
	03020031	Saint-François au pont-route 132 à Pierreville	18	668900	5103650
	03020037	Magog au pont-route 55 à l'est de Magog	18	727250	5017250
	03020083	Saint-François au barrage hydro-électrique au sud de Weedon-centre	19	308100	5059200
	03030023*	Yamaska au pont-route à Yamaska	18	661700	5096500
	03030031*	Yamaska sud-est à 3,2km de son embouchure avec la Yamaska à l'est de Farnham	18	662900	5014900
	03040009	Richelieu à l'usine de filtration de Sorel	18	644800	5097300
	03040012	Richelieu au pont du CN à l'est de Lacolle	18	631250	4990900
	03040015	Aux Brochets au pont-route 133 à Pike River	18	651800	4998250
	03090001	Châteauguay au pont-route 205 au nord de Sainte-Martine	18	593900	5015200
	03090005	Châteauguay à 1,6km en aval du pont à Powerscourt	18	565700	4985100

LISTE DES STATIONS (suite)

c) Réseau-rivières (fédérales-provinciales):

NUMÉRO NAQUADAT	NUMÉRO BQMA	DESCRIPTION	ZONE	COORDONNÉES UTM EST	COORDONNÉES UTM NORD
	04010002*	Du Nord au pont-route 344 à Saint-André-est	18	551700	5045450
	04020001	Rouge au pont-route 148 à l'ouest de Calumet	18	524100	5054300
	04040001	De la Petite Nation au pont-route 148 à l'ouest de Plaisance	18	490050	5049950
	04060004	Du Lièvre au pont-route à Buckingham	18	467300	5047900
	04080003	Gatineau au pont-route en amont du ruisseau Chelsea au nord de Gatineau	18	441450	5037100
	04080005	Gatineau au pont-route 107 à Maniwaki	18	425650	5136850
	04130002	Coulonge au pont-route 148 à Fort-Coulonge	18	365700	5078650
	04300002	Kinojevis au pont-route 117 à l'est de McWatters	17	658700	5341400
	04300003	Beauchastel au pont-rouge à 1km de son embouchure avec le lac Bruère	17	650500	5335950
	04310002	Des Outaouais au barrage de Carillon	18	548100	5046000
	04310008	Des Outaouais au barrage Chenaux	18	369300	5049000
	04310009	Des Outaouais au pont-route 101 à Témiscaming	17	645150	5174650
	04310010	Des Outaouais au pont-route 101 à Notre-Dame-du-Nord	17	613900	5271550
	04310011	Des Outaouais à la traverse de Masson	18	467900	5040900
	05010007	Saint-Maurice à l'usine de filtration de Trois-Rivières	18	683750	5139050
	05010013	Saint-Maurice au barrage de la Tuque	18	665850	5256800
	05080006	Jacques-Cartier au pont-route à l'embouchure à Donnacona	19	289550	5172900
	05220003	L'Assomption au pont-route à Le Gardeur	18	619100	5067300

LISTE DES STATIONS (suite)

c) Réseau-rivières (fédérales-provinciales):

NUMÉRO NAQUADAT	NUMÉRO BQMA	DESCRIPTION	COORDONNÉES UTM ZONE	EST	NORD
	06220001	Péribonca au pont-route 169 à Sainte Monique	19	290000	5402700
	06290002	Saguenay au pont-route à Chicoutimi	19	346850	5366250
	07100001	Aux Outardes à la centrale Outardes-2 à Chûte-aux-Outardes	19	544500	5442000
	07110001*	Manicouagan au pont-route 138 à l'ouest de Hauterive	19	549400	5448550
	07230003	Moisie au pont-route 138 au nord de Moisie	19	711600	5572200
	08070028	Bell au pont-route 113 à Rapides-des-Cèdres	18	3490100	5430500

* Nouvelles stations en 1986/87

PARAMÈTRES MESURÉS EN 1987/88

Qualité des eaux

a) Suivi d'intervention (provincial): paramètres à déterminer

b) Réseau lacs (fédéral-provincial):

- tests physiques: pH, conductivité, couleur vraie.
- ions majeurs: calcium, magnésium, potassium, sodium, chlorures, sulfates, alcalinité totale.
- éléments nutritifs: nitrites-nitrates, ammoniaque, carbone organique et inorganique dissous.
- métaux: aluminium (filtré) et fer.
- autres: acides forts.

c) Réseau-rivières (fédéral-provincial):

- Tests physiques: Température, conductivité, turbidité, couleur vraie, pH.
- ions majeurs: fluorures, alcalinité totale, alcalinité carbonatée, sodium, magnésium, sulfates, chlorures, potassium, calcium.
- élément nutritifs: carbone organique et inorganique dissous, azote total, nitrites-nitrates, azote ammoniacal, phosphore dissous total et phosphore particulaire.
- métaux: manganèse, fer, cuivre, zinc, arsenic, plomb, cadmium, nickel et chrome.
- autres: tannins et lignines.

PARAMÈTRES MESURÉS EN 1987/88

d) Substances toxiques

a) Bassins versants (provincial et fédéral-provincial):

N.B. Les tests suivants sont effectués à partir d'échantillons de poissons et/ou de sédiments.

- métaux:	arsenic, béryllium, cadmium, chrome, cuivre, fer, mercure, nickel, plomb, sélénium, vanadium, zinc.
- non métaux:	fluor
- hydrocarbures	acénaphtène, acénaphtylène, anthracène, benzo (a) anthracène, benzo (b) fluoranthène, benzo (k) fluoranthène benzo (a) pyrène, benzo (g.h.i) térylène, chrysène, diben: (a,h) anthracène, fluoranthène, fluorène, indéno (1,2,3-c,d) pyrène, naphtalène, phénanthrène, pyrène.
- pesticides organo-chlorés:	aldrine, dieldrine, DDD, DDE, DDT, endrine, époxyde d'heptachlore, heptachlore, hexachlorobenzène, lindane, métoxychlore, mirex.
- biphényles polychlorés (BPC).	
- Chlorophénols:	trichlorophénol, tétrachlorophénol, pentachlorophénol, hexachlorophénol.
- Chlorobenzènes:	monochlorobenzène, dichlorobenzène, trichlorobenzène, tétrachlorobenzène, pentachlorobenzène, hexachlorobenzène.
- Haloformes:	chloroforme, tétrachlorure de carbone
- Gras	
- Granulométrie	
- Pourcentage d'humidité	

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1987/88

REGION_____
NUMÉRO
DU PROJET____

TITRE DU PROJET: Réseau du Fleuve Saint-Laurent.

DURÉE: En cours (long terme).

ÉQUIPE D'ÉTUDE: Division Entente et Monitorage (514) 646-6043.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau. CODE DE C&P: 1.3

BUT:

1) Exercer une surveillance de la qualité du milieu aquatique dans la partie fluviale du fleuve Saint-Laurent,

2) Afin de déterminer quels sont les contaminants présents dans le milieu aquatique, leur concentration et leur distribution;

3) Afin d'évaluer les tendances historiques de leur concentration.

FONDEMENT: Le fleuve Saint-Laurent draine plusieurs des régions les plus industrialisées d'Amérique du Nord, soit plus particulièrement la région internationale des Grands lacs et la zone métropolitaine de Montréal. Il est reconnu qu'il transporte des quantités non négligeables de substances nutritives et/ou toxiques.

DESCRIPTION DU PROJET:

1) Echantillonner quatre (4) fois vingt-neuf (29) stations de base réparties entre Cornwall et Québec (Ile d'Orléans) et douze fois (12) une station avec observateur a Bécancour.

2) Echantillonner quatre (4) fois quatorze (14) stations satellites situées dans la zone d'influence des complexes industriels du sud du lac St-Louis, de Point-aux-Trembles, de Varennes et de Sorel.

3) Effectuer au laboratoire régional (Longueuil) les analyses des échantillons récoltés pour les tests physiques, les éléments nutritifs et les ions principaux.

4) Faire analyser au laboratoire national (Burlington) les échantillons récoltés pour les métaux lourds et pour les composés organiques toxiques.

5) Valider les résultats d'analyse et les acheminer dans la base de données NAQUADAT.

6) Rédiger pour septembre 1987 un rapport technique sur la variabilité spatiale de la qualité de l'eau du fleuve Saint-Laurent à partir des données récoltées à 77 stations en 1983-1984.

7) Rédiger pour septembre 1987 un rapport technique sur la zone d'influence de l'émissaire de la C.U.M. à partir des données récoltées a neuf stations entre 1983 et 1986.

8) Parrainer une proposition spontanée sur la détection de tendances temporelles dans l'évolution de la qualité de l'eau et le développement d'un logiciel à cet effet.

9) Publier pour décembre 1987 les résultats d'une étude de l'évolution de la qualité de l'eau du fleuve depuis 1950, à partir des données contenues dans NAQUADAT, suite à la réalisation de la proposition spontanée.

	RESSOURCES DES SERVICES VOTES: (MILLIERS DE DOLLARS)	RESSOURCES EXTERIEURES AUX SERVICES VOTES:	
	SOUS-TOTAL	SOUS-TOTAL	TOTAL
A-P TECH.			
A-P PROF.			
TOTAL DES A-P	2,6	—	2,6
TRAITEMENTS	88,0	—	88,0
FONCTIONNEMENT ET ENTRETIEN	37,0	83,0*	120,0
CONTRATS			
IMMOBILISATIONS			
TOTAL	125,0		208,0

* Proposition spontanée: MAF (78,0)
SPE (5,0)
DEI (5,0)

RÉSEAU DE SURVEILLANCE DU FLEUVE SAINT-LAURENT
PARAMÈTRES MESURÉS EN 1987-1988 ET FRÉQUENCE D'ÉCHANTILLONNAGE

Station	Groupes de paramètres							
	Tests physiques (1)	Ions principaux (2)	Éléments nutritifs (3)	Métaux lourds (4)	Cyanures	Arsenic et Sélénium	Mercure	BPC/OC (5)
9002	4	4	4	4				
9007	4	4	4	4				4
9016	4	4	4	4	1			
9017	4	4	4	4	1			
9019	4	4	4	4				
9020	4	4	4	4				
9026	4	4	4	4				
9027	4	4	4	4	1			
9028	4	4	4	4		4	4	
9058	4	4	4	4				
9060	4	4	4	4				
9061	4	4	4	4				
9062	4	4	4	4				
9063	4	4	4	4				
9064	4	4	4	4				
9065	4	4	4	4				
9066	4	4	4	4				
9067	4	4	4	4				
9201	4	4	4	4				4
9202	4	4	4	4				4
9205	4	4	4	4				4
9206	4	4	4	4				4
9207	4	4	4	4				4
9056	12	12	12	12				4

RÉSEAU DE SURVEILLANCE DU FLEUVE SAINT-LAURENT
PARAMÈTRES MESURÉS EN 1987-1988 ET FRÉQUENCE D'ÉCHANTILLONNAGE (SUITE)

Station	Groupes de paramètres							
	Tests physiques (1)	Ions principaux (2)	Eléments nutritifs (3)	Métaux lourds (4)	Cyanures	Arsenic et Sélénium	Mercure	BPC/OC (5)
9013	4	4	4	4	1	4	4	4
9014	4	4	4	4	1	4	4	4
9015	4	4	4	4	1	4	4	4
9031	4	4	4	4	1	4	4	4
9039	4	4	4	4	1		4	
9041	4	4	4	4	1		4	
9073	4	4	4	4	1		4	
9032	4	4	4	4		4	4	4
9033	4	4	4	4		4	4	4
9034	4	4	4	4		4	4	4
9035	4	4	4	4		4	4	4
9088	4	4	4	4	1	4	4	
9089	4	4	4	4	1	4	4	
9090	4	4	4	4	1	4	4	

Mesures faites sur le terrain: conductivité spécifique, pH, température, oxygène dissous.

(1) Tests physiques: pH, conductivité spécifique, couleur apparente, dureté calculée, matières solides en suspension, turbidité, température, alcalinité totale.

(2) Ions principaux: calcium, magnésium, sodium, potassium, chlorures, sulfates, fluor (une fois).

(3) Eléments nutritifs: phosphore total, nitrites et nitrates, carbone organique total.

(4) Métaux lourds: cadmium, cuivre, fer, nickel, plomb, zinc.

(5) BPC/OC: biphényles polychlorés et pesticides organochlorés (hexachlorobenzène;P,P'-DDT; O,P-DDT; P,P'-TDE; P,P'-DDE: P,P- méthoxychlore; heptachlore; epoxide d'heptachlore; alpha- endosulfane; alpha (cis) chlordane; gamma (trans) chlordane; gamma BHC (lindane); alpha BHC; mirex; aldrine; endrine; HEOD (dieldrine); arochlore).

Réseau du fleuve Saint-Laurent - Localisation des stations échantillonnées en 1987/8

Numéro de référence sur la carte	Numéro de la station NAQUADAT	DESCRIPTION	Stations de base
2	00QU020A9002	Rivière des Outaouais, canal Sainte Anne à Sainte Anne-de-Bellevue sous la route 20	
3	00QU02MC9007	Fleuve Saint-Laurent, canal de Beauharnois à Valleyfield, pont de la route 132, au centre de la voie navigable (00QU02MC0136)	
10	00QU020B9016	Fleuve Saint-Laurent à 25 m du quai de Lanoraie	
11	00QU020J9017	Fleuve Saint-Laurent à 50 m de la rive sud en face de Lanoraie	
12	00QU02NG9019	Fleuve Saint-Laurent sous le pont Laviolette à Trois-Rivières, côté nord, entre le deuxième et le troisième pilier	
13	00QU020D9020	Fleuve Saint-Laurent sous le pont Laviolette à Trois-Rivières, côté sud, entre le deuxième et le troisième pilier	
14	00QU020D9026	Fleuve Saint-Laurent au centre du pont Laviolette à Trois-Rivières, (voie navigable)	
15	00QU020J9027	Fleuve Saint-LAurent au centre de la voie navigable en face de Lanoraie	
16	00QU020A9028	Fleuve Saint-Laurent à la prise d'eau de l'usine de filtration de Montréal (Charles J. Desbaillet)	
27	00QU02PK9058	Fleuve Saint Laurent, à 30 m du quai de Leclercville	
28	00QU02PC9060	Fleuve Saint-Laurent, voie navigable, près de la bouée rouge D12 en face de Leclerville	
29	00QU02PC9061	Fleuve Saint-Laurent, à 30 m du quai de Saint-Charles-de-Grondines	
30	00QU02PH9062	Fleuve Saint-Laurent entre l'île d'Orléans et la rive sud (partie sud)	
31	00QU02PH9063	Fleuve Saint-Laurent entre l'île d'Orléans et la rive sud (au centre)	

Réseau du fleuve Saint-Laurent - Localisation des stations
échantillonnées en 1987/8, réseau de base (suite)

Numéro de référence sur la carte	Numéro de la station NAQUADAT	DESCRIPTION	Stations de base
32	00QU02PH9064	Fleuve Saint-Laurent entre l'île d'Orléans et la rive sud (partie nord)	
33	00QU02PE9065	Fleuve Saint-Laurent entre l'île d'Orléans et la rive nord (partie sud)	
34	00QU02PE9066	Fleuve Saint-Laurent entre l'île d'Orléans et la rive nord (au centre)	
35	00QU02PE9067	Fleuve Saint-Laurent entre l'île d'Orléans et la rive nord (partie nord)	
39	00QU02MC9201	Fleuve Saint-Laurent, au lac Saint-François, face à l'usine d'épuration de Cornwall à 250 m de la rive	
40	00QU02MC9202	Fleuve Saint-Laurent, au lac Saint-François, près de la bouée du diffuseur de Cornwall à 325 m en amont de l'île Pilon	
41	00QU02MC9205	Fleuve Saint-Laurent, au lac Saint-François, voie navigable, au sud de l'île Cornwall, en amont des bouées D95 et D96	
42	00QU02MC9206	Fleuve Saint-Laurent, au lac Saint-Franöis, à 250 m au nord de la réserve Saint-Régis à l'extrême ouest	
43	00QU02MC9207	Embouchure de la rivière Saint-Régis 30 m en amont de l'île Mud, sur la frontière Canada-Etats-Unis	
1	00QU02PA9056	Fleuve Saint-Laurent, voie navigable en amont du quai industriel de Bécancour	

Réseau du fleuve Saint-Laurent - Localisation des stations échantillonnées en 1987-88 pour l'émissaire de la C.U.M.

Numéro de référence sur la carte	Numéro de la station NAQUADAT	DESCRIPTION	Stations de base
7	00QU020A9013	Fleuve Saint-Laurent entre Grande Ile et la rive sud (près de Boucherville) à 600 m de l'île sous la ligne de transmission	
8	00QU020A9014	Fleuve Saint-Laurent entre l'île au Veau et Pointe-aux-Trembles sous la ligne de transmission à 400 m de l'île	
9	00QU020J9015	Fleuve Saint-Laurent à 300 m en aval de l'île Evers (près de Varennes) entre l'île aux Cerfeuils et l'île des Lauriers	
18	00QU020A9031	Fleuve Saint-Laurent entre l'île au Veau et Grande Ile au centre de la voie navigable sous la ligne de transmission	
24	00QU020J9039	Fleuve Saint-Laurent à 100 m de la rive nord, près de Repentigny	
25	00QU020B9073	Fleuve Saint-Laurent, côté nord de l'île Beauregard, à mi-chemin des berges.	
26	00QU020B9041	Fleuve Saint-Laurent à 100 m en avail de l'île Hertel (près du cap Saint-Michel au centre de la voie navigable)	
19	00QU020A9032	Fleuve Saint-Laurent, lac St-Louis, chenal Bergeron en aval de l'île du Diable	
20	00QU02MC9033	Rivière St-Louis à son embouchure, sur le pont de la route #132 à Beauharnois	
21	00QU020A9034	Fleuve Saint-Laurent, lac St-Louis à 300 m en amont de la Grande Ile	
22	00QU020A9035	Fleuve Saint-Laurent, lac St-Louis à 600 m au large de l'île Tambault	
4	00QU020J9088	Fleuve Saint-Laurent, vis-à-vis la bouée privée, à 150 m de la rive à l'ouest de Sorel	
5	00QU020J9089	Fleuve Saint-Laurent, vis-à-vis Pointe aux Pins, à 150 m de la berge et à 500 m du caisson, en amont de l'embouchure de la Richelieu	
6	00QU020J9090	Fleuve Saint-Laurent, à 400 m de l'entrée de la marina et à 1 km en aval de l'embouchure de la Richelieu	

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1987/1988

REGION Québec
NUMERO DU PROJET 3

TITRE DU PROJET: Réseau TDPA (LRTAP)

DUREE: En cours depuis 1983.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité des eaux — CODE DU C&P 1.3
Transports à Distance polluants atmosphériques — CODE DU C&P 4.2

BUTS: Contribuer à exercer une surveillance de l'évolution de l'acidification des eaux de surface au Québec et à déceler des modifications éventuelles de cette évolution suite à la réduction d'émissions à la source.

FONDEMENTS: Les inventaires physico-chimiques réalisés depuis 1980 dans les cours d'eau du Québec par divers organismes (DGEI-Q, Pêches et Océans, INRS-Eau, MENVIQ) ont démontré que le Québec est particulièrement vulnérable aux précipitations acides. Le réseau TDPA est en place depuis juin 1983 et il a été planifié par le programme de Planification et Gestion de la DGEI-Q. Depuis 1986/1987, le réseau a été étendu à la région de Pontiac Témiscamingue, ou six (6) nouveaux lacs sont échantillonnés sur une base temporelle. En 1987/1988, les analyses sont faites par la DQE et l'échantillonnage par Planification et Gestion.

DESCRIPTION DU PROJET:

1) Participer à l'opération mise en place depuis juin 1983; échantillonner 6 fois 18 stations temporelles et 2 fois 23 stations spatiales.
2) Effectuer au laboratoire régional (Longueuil) les analyses des 154 échantillons récoltés pour les tests physiques, les ions majeurs et les éléments nutritifs.
3) Faire analyser par le laboratoire central (Burlington) les 154 échantillons récoltés pour les métaux lourds.
4) Valider les résultats d'analyse et les acheminer dans la base de donnée NAQUADAT.
5) Participer au programme d'études comparatives inter-laboratoires du C.C.E.I. pour les projets sur les précipitations acides.

(MILLIERS DE DOLLARS)

	RESSOURCES DES SERVICES VOTES: Sous-total	RESSOURCES EXTERIEURES AUX SERVICES VOTES: Sous-total	Total
CODE DU C&P	1,3	4,2	
TOTAL DES A-P	0,8	0,5*	1,3
TRAITEMENTS	28,8	18,0*	46,8
FONCTIONNEMENT ET ENTRETIEN		75,0*	75,0
SUBVENTION IMMOBILISATIONS			
TOTAL	28,0	93,0*	121,8

* Ressources fournies par Planification et Gestion (Ste-Foy)

Réseau du transport à distance des polluants atmosphérique -
Localisation des stations échantillonnées en 1987-88

NO. NAQUADAT	DESCRIPTION
01QU02LH0185	Lac Bohème (S)
01QU02LH0186	Lac Clair (S)
01QU02LH0187	Lac Duck (S)
01QU02LF004	Las Sheridan
01QU02LF0002	Lac David (T)
01QU02LF0003	Lac Graham (S)
01QU02LD0004	Lac des Papillons (S)
01QU02LD0010	Lac Kidney
01QU02LD0005	Lac Blais
01QU02LD0008	Lac Griffin (S)
01QU02LD0011	Lac Grégoire (10222) (S)
01QU02LD0009	Lac Chevreuil (T)
01QU02LC0016	Lac General White
01QU02NF0001	Lac Adanys (S)
01QU020B0002	Lac Laurent (S)
01QU02LC0015	Lac Truite Rouge
01QU02NF0002	Lac Boisvert 36724 (S)
01QU02NF0005	Lac Nolette
01QU020C0002	Lac Joncs (S)
01QU02NE0001	Lac Fauvette (S)
01QU02NE0003	Lac Thibert (S)
01QU02NE0002	Lac Pothier 92844 (S)
01QU02NF0003	Lac Eclair (T)

Réseau du transport à distance des polluants atmosphérique -
Localisation des stations échantillonnées en 1987-88 (suite)

NO. NAQUADAT	DESCRIPTION
01QU02NE0003	Lac Chômeur (T)
01QU02PB0002	Lac Najoua (S)
01QU02PA0002	Lac Congré (S)
01QU02PB0003	Lac Lagou (T)
01QU02RG0001	Lac Daniel (S)
01QU02RG0002	Lac Lemaine (T)
01QU02PB0005	Lac Josselin
01QU02PB0004	Lac Veilleux (S)
01QU02PC0001	Lac Bonneville (T)
01QU02PD0002	Lac McLeod (S)
01QU02PF0001	Lac Belle Truite 35759 (S)
01QU02RH0001	Lac Thomas
01QU02LH0211	Lac Poirier (T)
01QU02KG0031	Lac Blériot (T)
01QU02JE0071	Lac Padnom (S)
01QU02KJ0031	Lac S. N. 6827 (T)
01QU02KG0051	Lac Murex (S)
01QU02KH0021	Lac S. N. 88188 (T)

1: S: station spatiale
T: station temporelle

PARAMETRES MESURES:

Mesures prises sur le terrain:	profils de température, pH, conductivité et oxygène dissous.
Tests physiques:	pH, conductivité spécifique, couleur vraie.
Ions principaux:	calcium, magnésium, sodium, potassium, chlorures, sulfates, silicates, alcalinité totale, alcalinité Gran.
Eléments nutritifs:	ammoniaque, nitrites et nitrates, carbone organique et inorganique dissous.
Métaux dissous:	Aluminium, fer, manganèse.

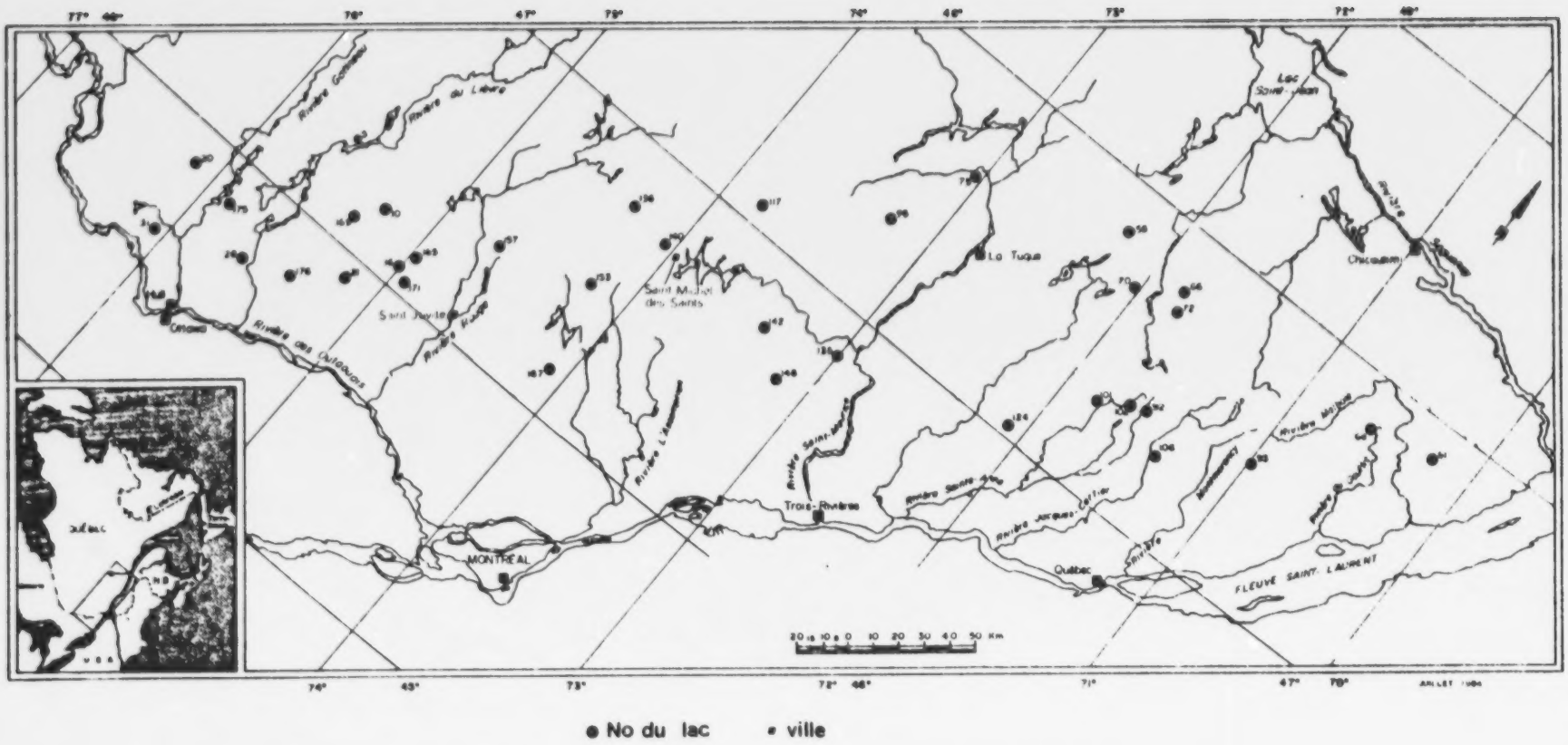


Fig. 6 LOCALISATION DES STATIONS D'ECHANTIONNAGE DU RESEAU TDPA 1987-88 (excluant les six lacs échantillonnés dans la région de l'Abitibi)

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1987/1988

REGION Québec
NUMERO DU PROJET 4

TITRE DU PROJET: Contribution au programme d'étude du lac Laflamme (TDPA)

DUREE: En cours.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau. CODE DU C&P 1.3

BUTS: Soutien analytique approprié pour le programme d'études entrepris par la DGEI-Q au lac Laflamme sur les effets des précipitations acides sur l'éco-système aquatique.

FONDEMENTS: La DGEI-Q poursuit depuis quelques années un programme de recherch au lac Laflamme sur les précipitations acides. Ce bassin versant calibré fait l'objet de recherches multidisciplinaires par plusieurs organismes (DGEI-Q, Centre de Recherche Forestière des Laurentides, Ministère des Pêches et Océans, Université Laval). Tous les travaux visent à circonscrir les effets des précipitations acides sur l'écosystème aquatique des forêts boréales. L'échantillonage de l'eau est réalisé par la Direction Planification et gestion.

DESCRIPTION DU PROJET:

1) Effectuer au laboratoire régional (Longueuil) l'analyse des 104 échantillons récoltés annuellement pour les tests physiques, les éléments nutritifs et les ions majeurs.

2) Valider les résultats d'analyse et les acheminer au chargé de projet.

(MILLIERS DE DOLLARS)

	RESSOURCES DES SERVICES VOTES: Sous-total	RESSOURCES EXTERIEURES AUX SERVICES VOTES: Sous-total	Total
A-P TECH.			
A-P PROF			
TOTAL DES A-P	0,4	---	0,4
TRAITEMENTS	18,8		18,8
FONCTIONNEMENT ET ENTRETIEN	13,4		13,4
SUBVENTION	-		-
IMMOBILISATIONS	---		---
TOTAL	32,2		32,2

DESCRIPTION DU PROJET — REGION: Québec
DIRECTION DE LA QUALITE DES EAUX — NUMERO DU PROJET: 5
1987/1988

TITRE DU PROJET: Réseau Transfrontalier Canada - Etats-Unis

DUREE: En cours.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau. CODE DU C&P 1.3

BUTS: Exercer une surveillance de la qualité du milieu aquatique dans des cours d'eau transfrontaliers entre le Québec et les Etats-Unis.

FONDEMENTS: La surveillance de la qualité des eaux transfrontalières permet d'identifier les problèmes de pollution chimique et/ou organique dans ces eaux. Le territoire étudié couvre des rivières situées aux frontières entre le Québec et les états du New York, Vermont et New Hampshire.

DESCRIPTION DU PRUJET:

1) Echantillonner par des observateurs 15 fois 10 station situées le long du 45^{e} parallèle entre le Québec et l'état de New York.
2) Effectuer au laboratoire régional (Longueuil) les analyses des échantillons récoltés pour les tests physiques, les éléments nutritifs et les ions majeurs.
3) Faire analyser par le laboratoire central (Burlington) les échantillons récoltés pour les métaux lourds.
4) Valider les résultats d'analyse et les acheminer dans la base de données NAQUADAT.
5) Publier pour Décembre 1987 un rapport sur l'eutrophisation de la baie Missisquoi à partir des données récoltées en 1983/84.
6) Participer à un comité technique de travail pour l'élaboration d'objectifs de qualité de l'eau dans la rivière des Outaouais.

	RESSOURCES DES SERVICES VOTES: (MILLIERS DE DOLLARS) Sous-total	RESSOURCES EXTERIEURES AUX SERVICES VOTES: Sous-total	Total
A-P TECH.			
A-P PROF.			
TOTAL DES A-P	0,5	---	0,5
TRAITEMENTS	18,0		18,0
FONCTIONNEMENT ET ENTRETIEN	10,0		10,0
SUBVENTION			
IMMOBILISATIONS	---		---
TOTAL	28,0		28,0

Réseau Transfrontalier - Localisation des stations prévues en 1986-87

Numéro de référence sur la carte	Numéro de la station NAQUADAT	DESCRIPTION	Stations de base
60	00QU020E9101	Ruisseau Hall à environ 1 km au nord de Comins Hill	
61	00QU020E9102	Ruisseau Leach à Hereford sur le pont menant à Hereford Hill	
63	00QU020E9108	Rivière Tomifobia sur le pont de la route entre Judge Mills et Baldwin Mills	
64	00QU020E9113	Rivière Tomifobia à la limite ouest de Rock Island sur la route 247 face à la maison 139	
65	00QU020H9116	Rivière Missisquoi près des douanes de Highwater, sud du ruisseau Mud	
66	00QU020H9117	Rivière Missisquoi sous le pont de la frontière à East Richford	
67	00QU020H9118	Rivière Sutton sous le pont de la route 139 à Abercorn	
68	00QU020H9119	Rivière aux Brochets sous le pont de la route 237 au sud de Frelighsburg, (premier au nord des douanes)	
69	00QU020H9161	Rivière de la Roche à son entrée au Québec sur la frontière	
70	00QU020A9143	Rivière à la truite sur la route 138 au sud de Kensington (aux douanes)	
71	00QU02MC9144	Rivière aux Saumons sur le quai en béton aux douanes de Dundee	

PARAMETRES MESURES:

- Tests physiques: pH, conductivité spécifique, couleur apparente, matière en suspensin, turbidité, alcalinité totale.
- Ions principaux: Calcium, magnésium, sodium, potassium, chlorures, sulfates.
- Eléments nutritifs: Phosphore total, nitrites-nitrates, carbone organique total.
- Métaux lourds: Aluminium, cadmium, cuivre, fer, manganèse, nickel, plomb et zinc.

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1987/1988

REGION Québec
NUMERO DU PROJET 6

TITRE DU PROJET: Réseau du Nouveau-Québec

DUREE: En cours depuis 1983.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau.

CODE DU C&P 1.3

BUTS: Acquérir des données de base sur la qualité de l'eau au Nouveau-Québec et développer un réseau d'échantillonnage pour assurer une surveillance de la qualité du milieu aquatique au nord du 55e parallèle.

FONDEMENTS: Pour assurer une surveillance continue de la qualité de l'eau de l'ensemble du territoire québécois, il s'avérait nécessaire qu'un réseau d'échantillonnage soit établi pour couvrir la partie septentrionale du Québec. Compte tenue que les réseaux du MENVIQ concernent des cours d'eau situés exclusivement au sud du 52e parallèle et que la Société d'Energie de la Baie James effectue une surveillance dans le territoire de la Baie James, le réseau du Nouveau-Québec a été établi prioritairement au nord du 55e parallèle.

DESCRIPTION DU PROJET:

1) Avec la collaboration de la direction des relevés aquatiques de Environnement Québec, échantillonner 3 fois 15 stations sur des rivières se déversant dans la baie d'Ungava et la baie d'Hudson.
2) Effectuer au laboratoire régional (Longueuil) les analyses des échantillons récoltés pour les tests physiques, les éléments nutritifs et les ions majeurs.
3) Faire analyser par le laboratoire central (Burlington) les échantillons pour les métaux lourds et les substances organiques (PCB/OC).
4) Valider les résultats d'analyse et les acheminer dans la base de données NAQUADAT.
5) Préparer un rapport préliminaire à partir des résultats obtenus entre mars 1983 et octobre 1986.

	RESSOURCES DES SERVICES VOTES: (MILLIERS DE DOLLARS) Sous-total	RESSOURCES EXTERIEURES AUX SERVICES VOTES: Sous-total	Total
A-P TECH.			
A-P PROF.			
TOTAL DES A-P	0,4	---	0,4
TRAITEMENTS	14,4		14,4
FONCTIONNEMENT ET ENTRETIEN	3,0		3,0
SUBVENTION IMMOBILISATIONS	---		---
TOTAL	17,4		17,4

Réseau Nouveau-Québec (provinciales et fédérales):

Numéro de référence sur la carte	Numéro de la station NAQUADAT	Description	Coordonnées UTM Zone	Est	Nord
80	OOQU03MC9404	Rivère à la Baleine, à 40,2 km de l'embouchure (à 7,7 km en amont de la Chaumaux)	19	587600	6408300
81	OOQU03LF9402	Rivière Caniapiscau, à la tête de la chûte de la Pyrite (rive ouest dans la baie)	19	481500	6370100
82	OOQU03KC9403	Rivière aux Mélèzes, a 7,6 km de la Koksoak (rive nord)	19	463300	6392000
83	OOQU03FA9405	Rivière Nastapoca, à 29 km de son embouchure (en amont de la pointe)	18	426300	6302400
84	OOQU03JB9409	Rivière aux Feuilles, à 6,4 km en aval de la Péladau (en amont de la pointe)	19	417500	6500700
85	OOQU03ED9401	Grande rivièree de la Baleine, à 30,6 km an amont de la Denys	18	347200	6116700
86	OOQU03HA9408	Rivière Arnaud, à 13,7 km en amont de la rivière Hamelin	19	337800	6653800
87	OOQU03MD9411	Rivière Georges à la sortie du lac de la Hutte sauvage (17 km en amont de la Falcoy et 2 km du rocher à la décharge du lac Terriault)	20	383439	6295369
88	OOQU03EC9413	Rivière Denys à 26,9 km de la Grande rivière de la Baleine (en amont du rapide)	18	367290	6097585
89	OOQU03FC9414	Petite rivière de la Baleine à 6,8 km en amont du chenal Ancel (lac Mollet, 4,1 km avant la rivière au sommet de la décharge du lac)	18	541495	6170330
90	O1QU03FA9415	Lac des Loups Marins (face aux deux îles à la sotie du lac vers la rivière Nastapoca)	18	547420	6256685
91	OOQU03FB9416	Rivière du Nord à 10,5 km de l'embouçure (lac Guillaume-Délisle)	18	425365	6265985
92	O1QU03JA9417	Lac Minto (à l'ouest des îles Simialuit)	18	513545	6350460
93	OOQU03FB9418	Rivière à l'eau claire, à la sortie du lac à l'eau claire (près du bout de l'île en triangle)	18	510145	6229365
94	OOQU03ED9419	Rivière Coast à 11,7 km de la Grande rivière de la Baleine	18	370905	6140360

RESEAU DE SURVEILLANCE DU NOUVEAU-QUEBEC (suite)

PARAMETRES MESURES:

- Tests physiques: PH, conductivité, turbidité, couleur apparente, matières solides en suspension, dureté calculée, température.

- Ions principaux: Calcium, magnésium, sodium, potassium, chlorures, sulfates et alcalinité totale.

- Eléments nutritifs: Phosphore total, nitrites-nitrates, carbone organique total

- Métaux: Aluminium, cadmium, cuivre, fer, cobalt, plomb et zinc.

- BPC/OC: Biphényles polychlorés et organochlorés i.e. arochlore total; hexachlorobenzène; p,p -DDT; o,p-DDT; p,p -DDD; p,p -DDE; p,p -métoxychlore; heptachlore; époxide d'heptachlore; alpha endosulfan; gamma-endosulfan; alpha-chlordane; gamma-chlordane; lindane; alpha-BHC; mirex; aldrine; endrine; dieldrine.

REGION: QUEBEC
NUMERO
DU PROJET: ST-87

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1987/88

TITRE DU PROJET: Dissémination des substances toxiques dans le fleuve Saint-Laurent.

NOM DU PROGRAMME NATIONAL: Produits chimiques-toxiques Code du C&P: 4.1

BUTS: 1. Dans le fleuve Saint-Laurent, recueillir des données sur les substances toxiques, les analyser, les interpréter et les rendre adéquates pour fins d'utilisation et d'interprétation.

2. Caractériser la présence et l'acheminement des substances toxiques provenant des Grands Lacs et du tronçon international du fleuve Saint-Laurent d'une part, et provenant du tronçon Montréal-Sorel d'autre part.

FONDEMENTS: La dissémination des produits chimiques toxiques a été identifiée comme problème majeur dans le fleuve Saint-Laurent.

DESCRIPTION:

1) Prélever des sédiments de fond à 20 stations dans le petit bassin de la Prairie; effectuer des analyses chimiques (au laboratoire national) et biologiques ("in house"). Acquérir de l'expertise dans les analyses biologiques (élutriation, bioessais) des sédiments.

2) Collaborer avec l'INRH (Saskatoon) et l'Université de Montréal et coordonner les travaux de recherche axés sur l'évaluation des substances toxiques dans les sédiments du fleuve Saint-Laurent.

3) Finaliser le traitement des données sur les sédiments du lac Saint-Louis, en faire une interprétation et rédiger deux rapports (entièrement par contrat).

4) Publier un rapport d'interprétation sur les tendances temporelles de la contamination des poissons (Hg, PCB) provenant des lacs Saint-Louis et Saint-François et deux rapports sur les petits poissons.

5) Faire effectuer au moyen d'un contrat le prélèvement des jeunes poissons à environ 5 stations* autour de Montréal; faire effectuer des analyses des produits toxiques au laboratoire national et à contrat.

* Localisation exacte à préciser.

6) Echantillonner une fois des sédiments en suspension au moyen d'une centrifugeuse en continu et extraire les substances chimiques toxiques au moyen de la colonne Seastar à quelques stations autour de l'émissaire de Montréal; faire effectuer les analyses par le laboratoire national.

7) Rédiger et publier un rapport sur les sédiments en suspension et l'extraction au moyen de la colonne Seastar.

8) Initier et identifier la structure et le format nécessaire pour une base de données informatisée des substances toxiques au Québec (données produites par la DEI/T).

9) Echantillonner le fleuve (2 stations, mensuel) et le lac David (1 station, bimestriel) pour les radionucleides; faire analyser, une fois, les trois échantillons (intégrés) au laboratoire de l'INRI à Burlington.

RESSOURCES (A-base, inclut 54K et 0,3 p.a. de Gestion et Planification)

A - P	3,0	
Salaires	115,5	
Fonctionnement	119,8	(50K = contrat)
Capital	23,6	
TOTAL	258,9	

(suite)

** HAP - Fluoranthène, benzo-b-fluoranthène, benzo-k-fluoranthène, benzo-a-pyrène, indénopyrène, benzopyrène.

*** CB - Chlorobenzènes, de 1 à 6 substitutions de chlore.

Paramètres de support:

Sédiments:	Granulométrie (gravier, sable, limon, argile) Carbone organique Carbone inorganique Azote total Phopsphore total Teneur en eau Matières volatiles à 550°C
Elutriats:	pH, Conductivité, matières solides en suspension, couleur, alcalinité, dureté; nitrites-nitrates, amnoniaque, phosphore total, carbone organique; calcium, magnésium, sodium, potassium, sulfates, chlorures.
Jeunes Poissons:	Lipides; Longueurs moyennes.
Radio-éléments:	pH, conductivité, température, turbidité, couleur alcalinité, dureté; nitrites-nitrates, phosphore total, calcium, magnésium, sodium, potassium, sulfates, chlorures.
Eau d'extraction:	pH, conductivité, matières solides en suspension, turbidité, phosphore total, calcium, magnésium, sodium, potassium, sulfates, chlorures.
Eau non centrifugée:	pH, conductivité, matières solides en suspension, turbidité, température, alcalinité, dureté; nitrites-nitrates, phosphore total, carbone organique total, calcium, magnésium, sodium, potassium, sulfates, chlorures.

Programme 4.1

SUBSTANCES TOXIQUES

	Sédiments de fond	Elutriats	Sédiments en suspension	Eau non centrifugé	Eau d'extraction	Jeunes poissons	Radio-éléments
Métalloïdes: Arsenic	X	X	–	–	–	X	X
Sélénium	X	X	–	–	–	X	X
Métaux: Aluminium	–	–	–	X	X	–	X
Cadmium	X	X	X	X	X	X	X
Cobalt	X	X	–	–	–	–	–
Chrome	X	X	–	–	–	X	–
Cuivre	X	X	X	X	X	X	X
Fer	X	X	–	X	X	–	X
Manganèse	X	X	–	X	X	–	X
Mercure	X	X	–	–	–	X	–
Molibdène	X	–	–	–	–	–	–
Nickel	X	X	X	X	X	X	X
Plomb	X	X	X	X	X	X	X
Vanadium	X	–	–	–	–	–	–
Zinc	X	X	X	X	X	X	X
Organiques: BPC/OC *	X	X	X	X	X	X	–
HAP **	X	X	X	X	X	X	–
CB ***	X	X	X	X	X	X	–
Radio-éléments:							
Antimoine 125	–	–	–	–	–	–	X
Ceasium 137	–	–	–	–	–	–	X
Radon 226	–	–	–	–	–	–	X
Strontium 90	–	–	–	–	–	–	X
Tritium	–	–	–	–	–	–	X
Uranium total	–	–	–	–	–	–	X

* BPC - Arochlores 1242, 1254, 1260
OC - HCB, aldrine, heptachlore, mirex, alpha, bêta et gamma-BHC, cis et trans-chlordane, p,p'-DDE,

RÉSEAU D'ÉCHANTILLONNAGE DES RADIOÉLÉMENTS DANS L'EAU

LISTE DES STATIONS, DES OPÉRATEURS, ET DE LA FRÉQUENCE D'ÉCHANTILLONNAGE

	Code de la station (NAQUADAT)	Description	Coordonnées Lat.	Long.	Fréquence d'échantillonnage	Opérateurs
1)	01QU02LF0002	Lac David (au sud-est de Maniwaki)	753500	4618300	6/an	DGEI (réseau du TADP)
2)	00QU02PA9056	Fleuve St-Laurent, quai de Bécancour, 2km en amont de la centrale nucléaire de Gentilly	722435	462354	12/an	Hydro-Québec
3)	00QU02PK9501	Fleuve St-Laurent, quai de l'usine Laprade, 2km en aval de la centrale nucléaire de Gentilly	721930	462410	12/an	Hydro-Québec

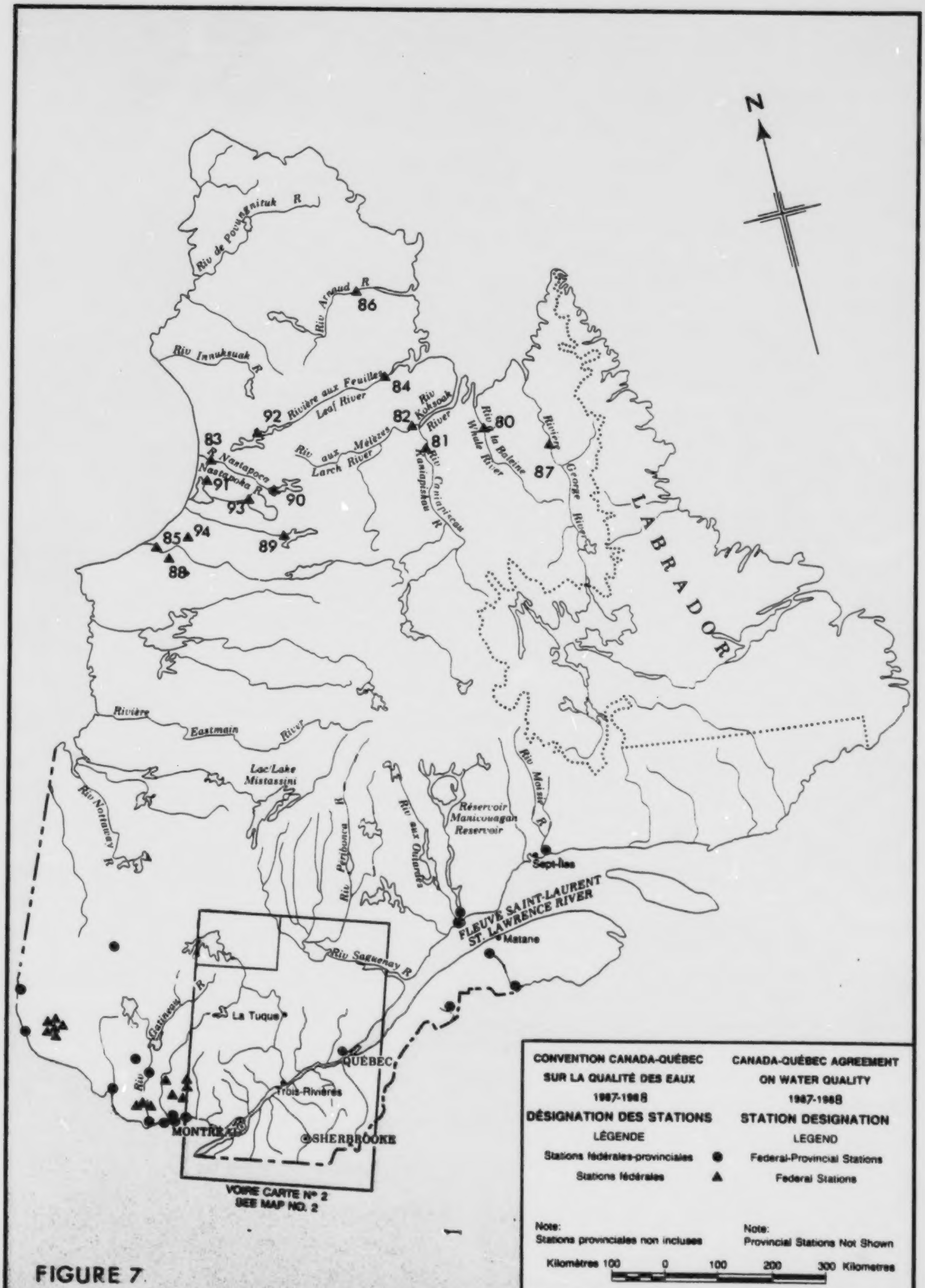

N
LABRADOR
Riv de Povungnituk R
Riv Arnaud R
Riv Innuksuak R
Rivière aux Feuilles
Leaf River
Riv aux Mélèzes
Larch River
Riv Koksoak River
Riv Caniapiscau
Kaniapiskau R
Riv à la Baleine
Whale River
Rivière George River
Nastapoca R
Nastapoka R
Rivière Eastmain River
Lac/Lake Mistassini
Riv Nottaway R
Riv Peribonca R
Riv aux Outardes
Réservoir Manicouagan Reservoir
Riv Moisie R
Sept-Îles
FLEUVE SAINT-LAURENT
ST. LAWRENCE RIVER
Matane
Riv Saguenay R
Riv Gatineau R
La Tuque
QUÉBEC
Trois-Rivières
MONTRÉAL
SHERBROOKE
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
VOIRE CARTE N° 2
SEE MAP NO. 2
CONVENTION CANADA-QUÉBEC SUR LA QUALITÉ DES EAUX 1987-1988
CANADA-QUÉBEC AGREEMENT ON WATER QUALITY 1987-1988
DÉSIGNATION DES STATIONS
STATION DESIGNATION
LÉGENDE
LEGEND
Stations fédérales-provinciales ● Federal-Provincial Stations
Stations fédérales ▲ Federal Stations
Note: Stations provinciales non incluses
Note: Provincial Stations Not Shown
Kilomètres 100 0 100 200 300 Kilometres

FIGURE 7

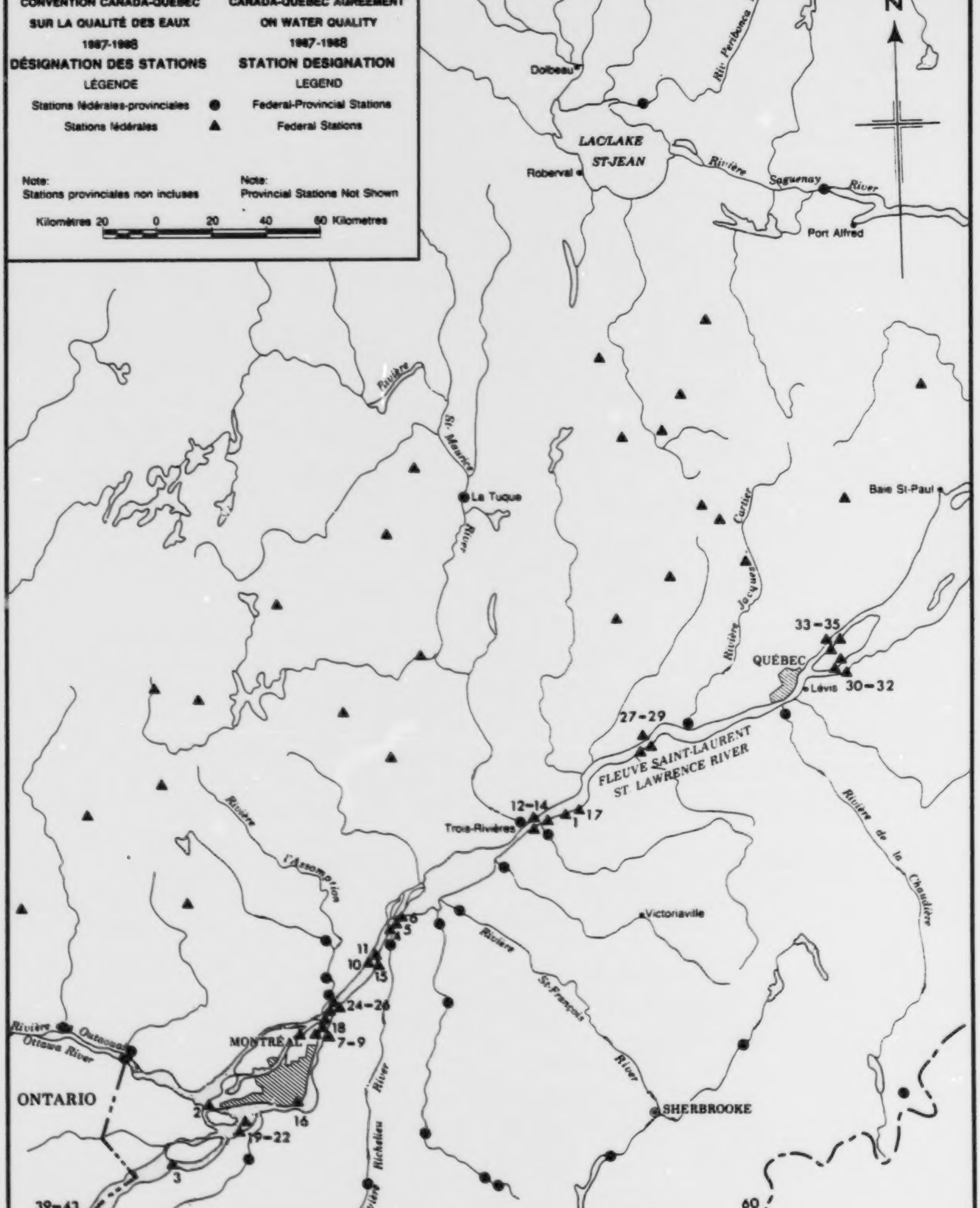

CONVENTION CANADA-QUÉBEC
SUR LA QUALITÉ DES EAUX
1987-1988
DÉSIGNATION DES STATIONS
LÉGENDE
Stations fédérales-provinciales
Stations fédérales
Note:
Stations provinciales non incluses
CANADA-QUÉBEC AGREEMENT
ON WATER QUALITY
1987-1988
STATION DESIGNATION
LEGEND
Federal-Provincial Stations
Federal Stations
Note:
Provincial Stations Not Shown
Kilomètres 20 0 20 40 60 Kilometres
N
Dolbeau
Riv. Peribonca R
LAC/LAKE
ST-JEAN
Roberval
Rivière Saguenay River
Port Alfred
La Tuque
St. Maurice River
Rivière Jacques Cartier
Baie St-Paul
33-35
QUÉBEC
Lévis
30-32
27-29
FLEUVE SAINT-LAURENT
ST LAWRENCE RIVER
12-14
1
17
Trois-Rivières
Rivière l'Assomption
Victoriaville
Rivière de la Chaudière
Rivière St-François River
11
10
15
24-26
18
7-9
MONTRÉAL
Rivière des Outaouais
Ottawa River
ONTARIO
2
16
19-22
3
Rivière Richelieu River
Riv Chateauguay R
SHERBROOKE
39-43
71
70
69
68
67
65
64
63
60
61
Lac/Lake
Champlain
ÉTATS-UNIS
UNITED STATES

FIGURE 8

D.3 ONTARIO REGION

Région de l'Ontario

Table 1. WQB-OR RESOURCE SUMMARY 1987/88 - May 22, 1987

		IWD "A"-BASE				RDG FUNDING				
	PROJ.	PY	O&M	CAP	SAL	PY	O&M	CAP	SAL	TOTAL
PROGRAM C&P 1.1										
	101	0.60	3.50			27.72				31.22
	102	1.00	10.00			46.21				56.21
	107	0.10	2.00			4.62	0.40		14.00	20.62
	109	0.40	4.00			18.48				22.48
	110	0.70	8.00			32.34		9.00		49.34
	111	0.20	5.00			9.25				14.25
	112	0.20	3.50			9.25		11.00		23.75
	130	1.25	11.80		15.70	57.76			10.00	95.26
		4.45	47.80		15.70	205.63	0.40	20.00	10.00	14.00 313.13
PROGRAM C&P 1.3										
	121	0.20	4.00			9.24				13.24
	124	1.00	15.00			46.21				61.21
	125	0.70	5.00			32.34				37.34
		1.90	24.00		87.79				111.79	
PROGRAM C&P 4.1										
	101	0.80	1.50			36.97	0.20			7.0 45.47
	103	0.15	2.00			6.93	0.20	13.00		7.0 28.93
	106	0.30	2.00			13.86		13.00		28.86
	108	0.80	2.00			37.00	1.20	13.00		42.00 94.00
	111	0.75	5.00			34.67		11.00		50.67
	112	0.50	1.00			23.10				24.10
	122	0.50	7.00			23.10				30.10
	130	1.20	24.60			55.47			5.00	85.07
	135	0.90	8.00			41.59				49.59
		5.90	53.10			272.69	1.60	50.00	5.00	56.00 436.79
		12.25	124.90		15.70	566.11	2.00	70.00	15.00	70.00 861.71

TOTAL BY PROJECT			
		PY	$
Project	101	1.60	76.69
	102	1.00	56.21
	103	0.35	28.93
	106	0.30	28.86
	107/8	2.50	114.62
	109/12	1.10	70.33
	110/11	1.65	114.26
	121	0.20	13.24
	122	0.50	30.10
	124	1.00	61.21
	125	0.70	37.34
	130	2.45	180.33
	135	0.90	49.59
TOTAL		14.25	861.71

PROJECT DESCRIPTION — REGION/HQ : Ontario
WATER QUALITY BRANCH - 1987/88 — PROJECT NO: WQ-101

PROJECT TITLE: GREAT LAKES SURVEILLANCE

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management/Toxic Chemicals — **C&P CODE:** 1.1 & 4.1

STUDY TEAM: R. Stevens (Ontario); M. Neilson (Superior, Huron)

GOALS:

1. Conduct one full-chemistry cruise on each of the 3 Great Lakes during spring period (0.05 PY).
2. During summer stratified period, conduct one limited chemistry cruise on Lake Huron, 3 limited chemistry cruises on Ontario (0.05 PY).
3. Conduct one spring organic contaminant survey on each of the 3 Great Lakes to corroborate previous data - limited stations for OC's/PCB's/PAH's/CB's (0.30 PY).
4. Write up (including revisions to) 1986/87 inter-lake organic contaminants results for publication in primary literature (0.6 PY). Draft by July 10/87.
5. Write up Lake Superior data collected 1973-1986 for IWD publication (0.15 PY). Draft by Sept. 25/87.
6. Investigate anomalies observed on Lake Ontario during 1976 high water year (0.15 PY). Draft by Sept. 4/87.
7. Summarize 1985 trace metal data (0.25 PY). Draft by Nov. 20/87.
8. Respond to public information requests, as required (0.05 PY).

RATIONALE:

This is an ongoing program to fulfill Canada's commitment for Surveillance and Monitoring under the Canada-U.S. Great Lakes Water Quality Agreement.

DESCRIPTION:

Program involves planning, organizing and conducting a series of sampling cruises on each of the 3 Great Lakes for which Canada has responsibility under the Great Lakes International Surveillance Plan. Water samples are collected at a series of stations on the Lakes and will be analysed for a set of selected organic and inorganic chemical parameters. Data obtained from surveillance cruises will be summarized and interpreted by the study team and reports or scientific papers will be reproduced.

	A-BASE RESOURCES: ($'000)		NON A-BASE RESOURCES: ($'000)	
	Sub-total		Sub-total	Total
C&P CODE	1.1	4.1	4.1	1.1 & 4.1
PY TECH. PROF				
TOTAL PY	0.6	0.8	0.2	1.6
SALARIES	27.72	36.97	7.0	71.69
O&M	3.5	1.5	--	5.0
CONTRACTS	--	--	--	--
CAPITAL	--	--	--	--
TOTAL	31.22	38.47	7.0	76.69

SAMPLING STATION POSITIONS LAKE SUPERIOR 1987

STATION NUMBER	LATITUDE N.	LONGITUDE N.
1	46° 29' 06"	84° 50' 00"
2	46° 32' 36"	84° 44' 54"
3	46° 36' 00"	84° 35' 30"
6	46° 44' 36"	84° 55' 00"
8	46° 53' 36"	84° 40' 03"
11	47° 18' 36"	84° 39' 30"
12	47° 02' 12"	85° 06' 12"
17	46° 42' 48"	85° 49' 06"
22	46° 58' 06"	85° 43' 40"
23	47° 12' 48"	85° 38' 00"
25	47° 27' 18"	85° 16' 30"
28	47° 35' 06"	85° 03' 54"
30	47° 43' 12"	85° 08' 20"
31	47° 55' 06"	84° 54' 46"
34	47° 50' 00"	85° 12' 30"
35	47° 55' 54"	85° 16' 12"
39	47° 41' 24"	85° 58' 00"
43	47° 04' 48"	86° 28' 40"
50	46° 30' 30"	86° 34' 06"
51	46° 31' 00"	87° 20' 12"
52	46° 34' 00"	87° 19' 56"
62	47° 10' 00"	87° 38' 36"
68	47° 01' 00"	88° 11' 00"
69	46° 51' 42"	88° 25' 48"
70	47° 03' 00"	88° 18' 00"
80	47° 35' 00"	86° 57' 02"
84	48° 06' 48"	86° 18' 00"
89	48° 42' 00"	86° 25' 06"
92	48° 35' 00"	86° 33' 54"
95	48° 13' 06"	87° 01' 00"
100	48° 45' 24"	86° 58' 33"
101	48° 44' 06"	87° 10' 00"
102	48° 36' 54"	87° 26' 09"
105	48° 44' 00"	87° 33' 48"
106	48° 34' 30"	88° 07' 00"
113	48° 08' 42"	87° 42' 12"
121	47° 29' 00"	87° 50' 00"
125	47° 36' 18"	88° 13' 00"
130	48° 06' 30"	88° 27' 30"
133	48° 17' 00"	88° 35' 50"

SAMPLING STATION POSITIONS LAKE SUPERIOR 1987

STATION NUMBER	LATITUDE N.	LONGITUDE N.
135	48° 19' 48"	88° 38' 00"
136	48° 17' 24"	88° 49' 48"
137	48° 18' 06"	88° 57' 00"
138	48° 25' 00"	88° 56' 00"
139	48° 17' 54"	89° 10' 48"
140	48° 09' 00"	89° 08' 54"
149	47° 53' 00"	89° 38' 24"
152	47° 41' 18"	89° 28' 00"
155	47° 48' 12"	89° 08' 48"
157	47° 36' 48"	89° 00' 00"
164	47° 01' 36"	89° 02' 18"
165	46° 53' 30"	89° 20' 51"
169	47° 12' 24"	89° 40' 00"
171	47° 27' 00"	89° 55' 15"
177	47° 43' 00"	90° 20' 00"
180	47° 28' 00"	90° 51' 18"
185	47° 06' 00"	90° 27' 45"
189	46° 50' 42"	90° 11' 20"
192	46° 42' 00"	90° 01' 54"
193	46° 38' 00"	90° 18' 00"
196	46° 44' 54"	90° 42' 12"
198	47° 00' 36"	90° 59' 00"
201	47° 07' 54"	91° 06' 42"
203	47° 13' 18"	91° 12' 18"
205	47° 03' 12"	91° 34' 00"
207	47° 00' 12"	91° 30' 54"
211	46° 50' 12"	91° 20' 42"
212	46° 45' 00"	91° 40' 30"
216	46° 54' 24"	91° 49' 12"
218	46° 49' 00"	91° 53' 06"
220	46° 42' 18"	91° 57' 54"
221	46° 46' 54"	92° 03' 15"

PARAMETER LIST
LAKE SUPERIOR

temp.
specific conductance
pH
dissolved oxygen
filtered chloride
filtered sulphate
filtered calcium
alkalinity
phosphorus - total, unfiltered
- total, filtered
- soluable reactive
nitrogen - filtered ammonia
- filtered nitrate-plus-nitrite
- total particulate
carbon - dissolved organic
- particulate organic
soluble reactive silica
chlorophyll a - corrected
- uncorrected
alkyl lead
benzo-a-pyrene
indenopyrene
benzopyrene
benzo-k-fluoranthene
benzo-b-fluoranthene
fluoranthene

Hexachlorobenzene
Alpha-BHC
Lindance
Heptachlor
Aldrin
Heptachlor Epoxide
Gamma(trans)-chlordane
Alpha(cis)-chlordane
Alpha-endosulfan
p,p'-DDE
Dieldrin
Endrin
o,p'-DDT
p,p'-TDP
p,p'-DDT
Beta-endosulfan
Mirex
Methoxychlor
Total PCB
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4,5-Tetrachlorobenze
1,2,3,5-Tetrachlorobenze
1,2,3,4-Tetrachlorobenze
Pentrachlorobenzene

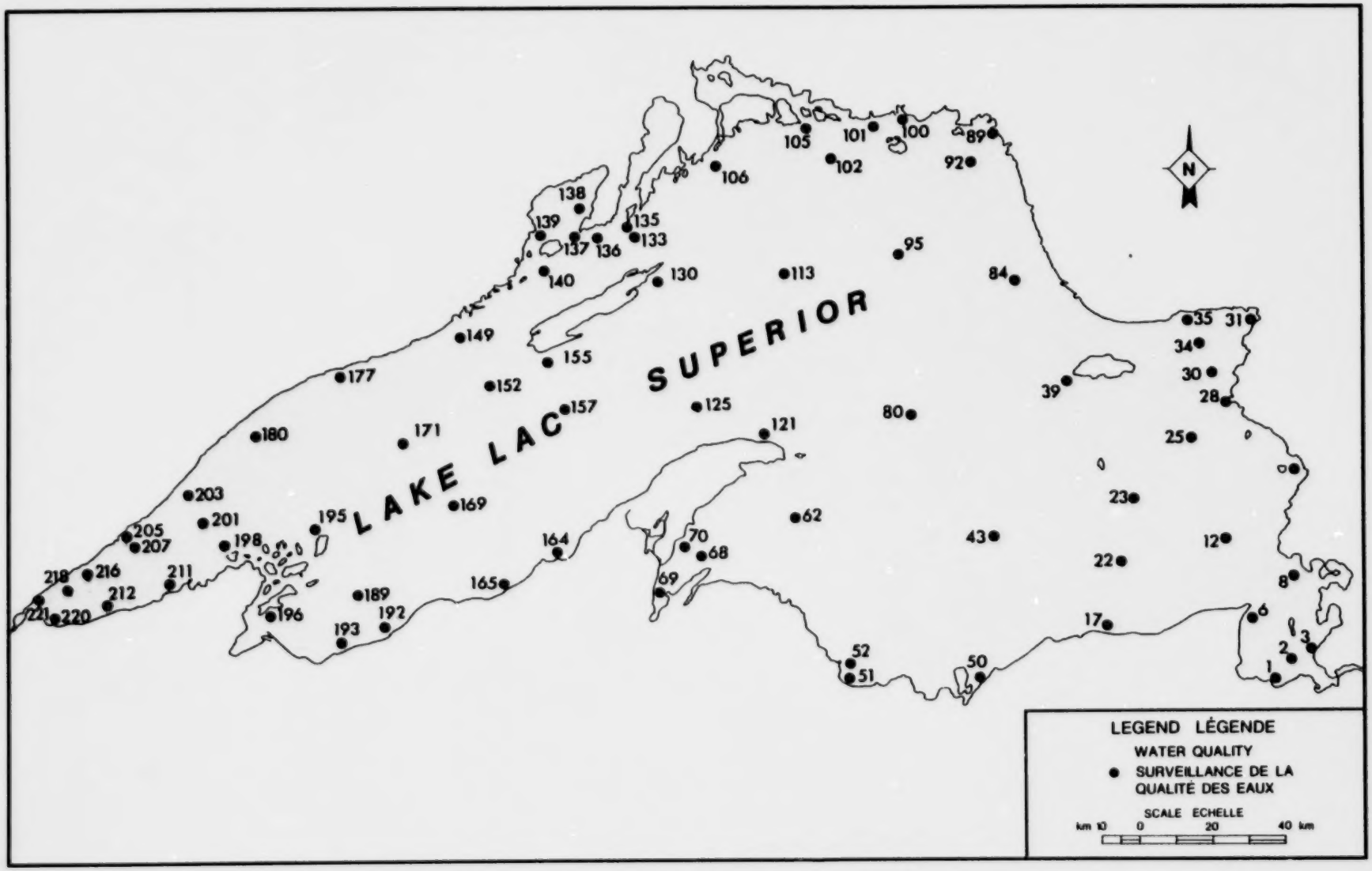


FIGURE 9 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

Sampling Stations
Lake Huron
1986-87

Station Number	Latitude N.	Longitude N.
1	43° 05' 24"	82° 23' 30"
3	43° 15' 25"	82° 02' 18"
4	43° 19' 30"	81° 47' 18"
5	43° 32' 54"	81° 44' 42"
7	43° 20' 30"	82° 30' 24"
8	43° 34' 00"	82° 29' 06"
9	43° 38' 00"	82° 13' 00"
10	43° 45' 12"	81° 46' 54"
11	43° 57' 24"	81° 47' 12"
12	43° 53' 24"	82° 03' 24"
13	43° 45' 12"	82° 34' 06"
14	43° 56' 30"	82° 40' 00"
17	44° 06' 00"	82° 52' 00"
20	44° 13' 00"	83° 05' 00"
23	44° 20' 00"	83° 18' 00"
27	44° 11' 54"	82° 30' 12"
29	44° 22' 00"	81° 50' 00"
30	44° 28' 00"	81° 27' 12"
32	44° 27' 12"	82° 20' 30"
33	44° 30' 00"	82° 50' 00"
34	44° 38' 24"	83° 13' 54"
36	45° 02' 06"	83° 22' 42"
38	01ON02IH0014	
39	44° 39' 24"	81° 22' 42"
40	44° 53' 54"	81° 26' 12"
41	45° 05' 00"	81° 32' 18"
42	45° 13' 18"	81° 49' 12"
43	45° 00' 48"	82° 00' 30"
44	45° 01' 00"	82° 41' 06"
47	45° 15' 18"	83° 20' 48"
48	45° 16' 42"	82° 27' 06"
50	45° 32' 06"	82° 02' 42"
52	45° 39' 06"	82° 38' 54"
54	45° 31' 00"	83° 25' 00"
55	45° 23' 30"	83° 39' 06"

Sampling Stations
Lake Huron
1987
(Continued)

Station Number		Latitude N.	Longitude N.
56		45° 31' 00"	84° 05' 00"
58		45° 52' 06"	83° 16' 00"
59		45° 46' 00"	83° 01' 42"
60		45° 54' 06"	83° 31' 06"
61		45° 45' 00"	83° 55' 00"
62		45° 40' 30"	84° 11' 12"
63		45° 42' 12"	84° 30' 42"
64		45° 48' 48"	84° 45' 18"
65		45° 50' 42"	84° 34' 00"
66		45° 51' 48"	84° 17' 42"
67		45° 56' 06"	83° 54' 00"
68		46° 02' 30"	83° 51' 12"
69		46° 04' 42"	84° 01' 42"
70		46° 08' 12"	83° 40' 18"
71		46° 14' 00"	83° 44' 48"
73		46° 11' 12"	83° 12' 18"
76		46° 00' 00"	83° 26' 00"
77		45° 58' 12"	83° 11' 54"
79		46° 07' 24"	82° 53' 09"
82		45° 56' 18"	82° 45' 30"
83		46° 00' 00"	82° 33' 00"
84		46° 05' 30"	82° 33' 24"
87		46° 03' 40"	82° 11' 50"
88		46° 03' 20"	82° 00' 00"
89		45° 55' 00"	82° 09' 40"
95)		44° 12' 45"	83° 22' 15"
96)		44° 07' 35"	83° 10' 15"
97)		44° 06' 55"	83° 31' 45"
98)		43° 58' 35"	83° 34' 32"
99)	Saginaw Bay	43° 54' 30"	83° 44' 30"
)			
100)		43° 49' 30"	83° 49' 02"
101)		43° 49' 15"	83° 37' 30"

Sampling Stations
Georgian Bay
1987

Station Number	Latitude N.	Longitude N.
1	44° 43' 03"	80° 51' 24"
3	44° 43' 30"	80° 37' 00"
4	44° 38' 45"	80° 10' 00"
5	44° 47' 48"	80° 14' 36"
6	44° 44' 12"	80° 26' 06"
8	44° 57' 10"	80° 08' 06"
9	44° 52' 18"	79° 58' 05"
11	44° 55' 15"	80° 36' 21"
12	44° 55' 12"	80° 52' 30"
15	45° 10' 00"	80° 17' 48"
16	45° 21' 13"	80° 29' 12"
17	010N02IG0003	
19	45° 04' 00"	81° 15' 14"
21	45° 21' 54"	81° 11' 24"
24	45° 40' 44"	80° 50' 20"
26	45° 50' 00"	80° 54' 00"
27	45° 52' 00"	81° 00' 00"
29	45° 35' 00"	81° 05' 00"
31	45° 14' 18"	81° 26' 24"
33	45° 22' 13"	81° 35' 06"
35	45° 31' 39"	81° 40' 10"
36	45° 42' 30"	81° 37' 12"
39	45° 52' 24"	81° 15' 30"
42	45° 54' 46"	81° 35' 42"

PARAMETER LIST
LAKE HURON AND GEORGIAN BAY

temp.
specific conductance
pH
dissolved oxygen
filtered chloride
filtered sulphate
filtered calcium
alkalinity
phosphorus - total, unfiltered
- total, filtered
- soluable reactive
nitrogen - filtered ammonia
- filtered nitrate-plus-nitrite
- total particulate
carbon - dissolved organic
- particulate organic
soluble reactive silica
chlorophyll a - corrected
- uncorrected
alkyl lead
benzo-a-pyrene
indenopyrene
benzopyrene
benzo-k-fluoranthene
benzo-b-fluoranthene
fluoranthene

Hexachlorobenzene
Alpha-BHC
Lindance
Heptachlor
Aldrin
Heptachlor Epoxide
Gamma(trans)-chlordane
Alpha(cis)-chlordane
Alpha-endosulfan
p,p'-DDE
Dieldrin
Endrin
o,p'-DDT
p,p'-TDP
p,p'-DDT
Beta-endosulfan
Mirex
Methoxychlor
Total PCB
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4,5-Tetrachlorobenze
1,2,3,5-Tetrachlorobenze
1,2,3,4-Tetrachlorobenze
Pentrachlorobenzene

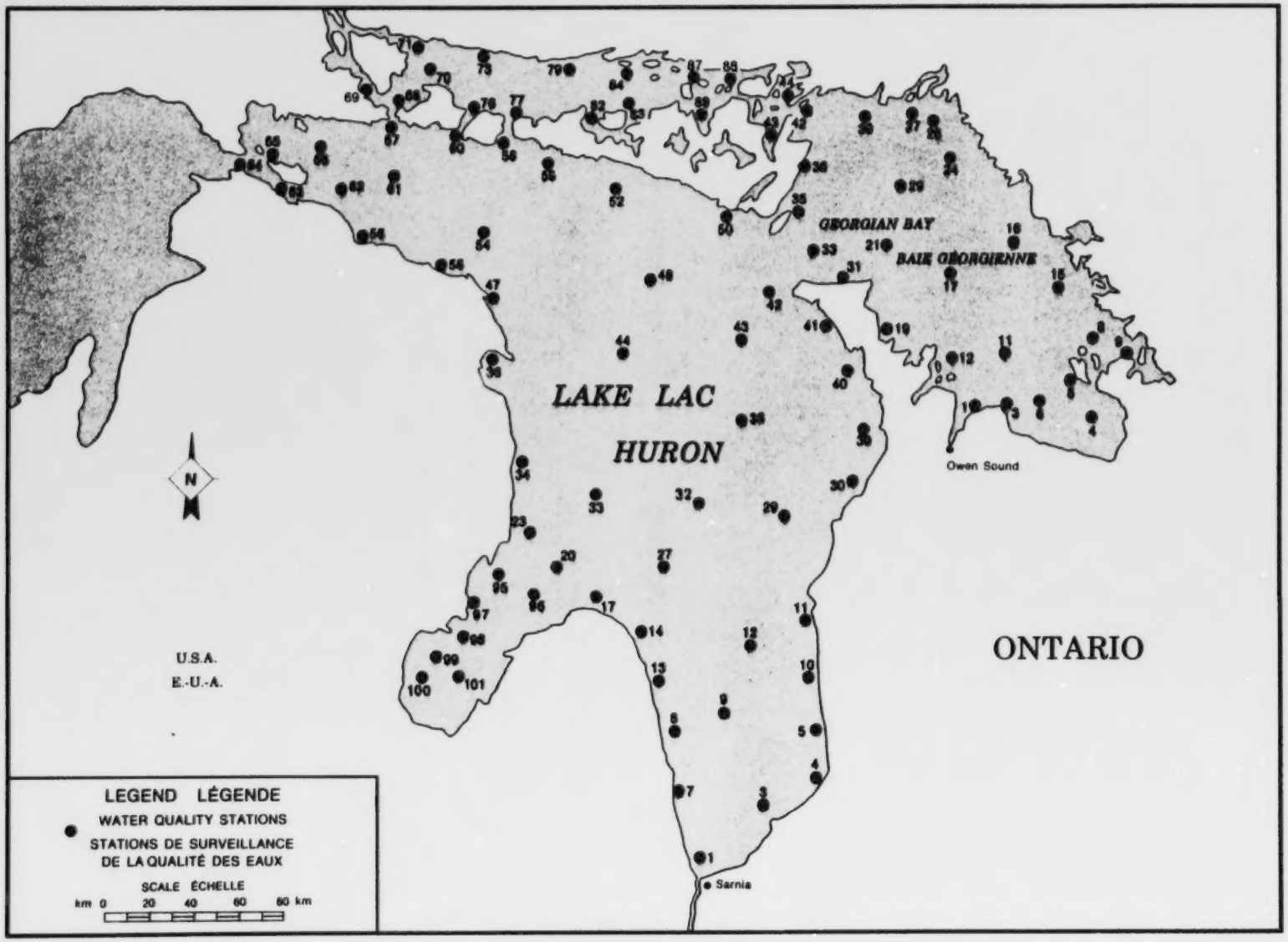


FIGURE 10 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

Surveillance Stations
Lake Ontario
1987

Station Number	Latitude N.	Longitude N.
1	43° 18' 48"	79° 45' 06"
2	43° 20' 24"	79° 39' 54"
3	43° 16' 06"	79° 37' 12"
5	43° 25' 30"	79° 39' 30"
6	43° 28' 00"	79° 31' 48"
7	43° 32' 48"	79° 29' 18"
8	43° 37' 24"	79° 27' 12"
9	43° 35' 12"	79° 23' 42"
10	43° 40' 06"	79° 16' 00"
11	43° 35' 06"	79° 18' 42"
12	43° 30' 12"	79° 21' 12"
13	43° 25' 00"	79° 24' 00"
14	43° 23' 36"	79° 29' 12"
15	43° 19' 00"	79° 26' 36"
16	43° 16' 18"	79° 21' 36"
17	43° 13' 30"	79° 16' 18"
18	43° 18' 12"	79° 16' 42"
19	43° 23' 00"	79° 17' 06"
20	43° 20' 18"	79° 11' 48"
21	43° 18' 00"	79° 07' 12"
22	43° 17' 48"	79° 00' 18"
23	43° 22' 12"	79° 04' 00"
24	43° 26' 24"	79° 07' 42"
25	43° 31' 00"	79° 04' 48"
26	43° 36' 30"	79° 01' 00"
27	43° 42' 12"	78° 57' 24"
28	43° 46' 30"	78° 51' 18"
29	43° 49' 48"	78° 52' 12"
30	43° 49' 48"	78° 39' 42"
31	43° 53' 12"	78° 27' 36"
32	43° 47' 00"	78° 26' 18"
33	43° 35' 48"	78° 48' 06"
34	43° 27' 42"	78° 45' 36"
35	43° 21' 36"	78° 43' 48"
36	43° 29' 30"	78° 23' 12"

Surveillance Stations
Lake Ontario
1987
(Continued)

Station Number	Latitude N.	Longitude N.
37	43° 23' 30"	78° 22' 12"
38	43° 23' 00"	77° 59' 24"
39	43° 29' 12"	78° 00' 00"
40	43° 35' 24"	78° 00' 42"
41	010N02I00021	
42	43° 50' 24"	78° 02' 18"
43	43° 57' 00"	78° 03' 00"
44	43° 52' 54"	77° 54' 30"
45	43° 49' 12"	77° 47' 00"
46	43° 53' 06"	77° 41' 24"
47	43° 57' 06"	77° 35' 18"
48	43° 51' 42"	77° 31' 30"
49	43° 46' 18"	77° 26' 18"
52	43° 26' 00"	77° 42' 42"
53	43° 21' 00"	77° 42' 42"
54	43° 24' 48"	77° 34' 30"
55	43° 26' 36"	77° 26' 18"
56	43° 21' 36"	77° 30' 54"
57	43° 16' 30"	77° 35' 30"
58	43° 19' 42"	77° 26' 18"
59	43° 22' 54"	77° 17' 54"
60	43° 34' 48"	77° 12' 00"
61	43° 47' 12"	77° 09' 30"
62	43° 52' 48"	76° 00' 00"
63	43° 43' 54"	77° 01' 00"
64	43° 31' 30"	76° 55' 36"
65	43° 25' 24"	76° 53' 00"
66	43° 20' 00"	76° 50' 24"
67	43° 24' 30"	76° 47' 42"
68	43° 31' 48"	76° 43' 54"
69	43° 36' 24"	76° 42' 48"
70	43° 32' 30"	76° 37' 06"
71	43° 28' 36"	76° 31' 36"
72	43° 33' 00"	76° 31' 30'
73	43° 38' 00"	76° 17' 18"

Surveillance Stations
Lake Ontario
1987
(Continued)

Station Number	Latitude N.	Longitude N.
74	43° 45' 00"	76° 31' 06"
75	43° 50' 36"	76° 21' 18"
76	43° 57' 00"	76° 10' 30"
77	43° 57' 00"	76° 24' 30"
78	44° 57' 24"	76° 24' 24"
79	44° 04' 30"	76° 31' 18"
80	44° 08' 30"	76° 31' 18"
81	44° 01' 00"	76° 40' 18"
82	44° 04' 00"	76° 48' 42"
83	44° 00' 00"	76° 50' 36'
84	43° 53' 12"	76° 44' 00"
85	43° 45' 00"	79° 05' 00"
86	43° 15' 18"	79° 11' 42"
87	43° 17' 54"	77° 31' 06"
88	43° 35' 18"	76° 25' 00"
89	43° 41' 54"	76° 25' 00"
90	44° 08' 11"	76° 49' 30"
91	43° 55' 12"	78° 18' 24"
93	43° 19' 36"	78° 52' 06"
94	43° 19' 30"	77° 13' 00'
95	43° 18' 48"	77° 00' 00"
96	43° 13' 24"	79° 26' 48"
97	43° 57' 42"	76° 07' 18"
98	43° 56' 06"	76° 13' 54
100	44° 08' 12"	76° 19' 48"
101	44° 11' 36"	76° 18' 36"
102	44° 12' 12"	76° 14' 12"

PARAMETER LIST
LAKE ONTARIO

temp.
% transmission
specific conductance
pH
total dissolved solids
dissolved oxygen
filtered chloride
filtered sulphate
filtered calcium
filtered sodium
filtered potassium
filtered magnesium
alkalinity
phosphorus - total, unfiltered
- total, filtered
- soluable reactive
nitrogen - filtered ammonia
- filtered nitrate-plus-nitrite
- total particulate
- total kjeldahjl nitrogen
carbon - dissolved organic
- particulate organic
soluble reactive silica
chlorophyll a - corrected
- uncorrected
alkyl lead
benzo-a-pyrene
indenopyrene
benzopyrene
benzo-k-fluoranthene
benzo-b-fluoranthene
fluoranthene

Hexachlorobenzene
Alpha-BHC
Lindance
Heptachlor
Aldrin
Heptachlor Epoxide
Gamma(trans)-chlordane
Alpha(cis)-chlordane
Alpha-endosulfan
p,p'-DDE
Dieldrin
Endrin
o,p'-DDT
p,p'-TDP
p,p'-DDT

Beta-endosulfan
Mirex
Methoxychlor
Total PCB
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4,5-Tetrachlorobenze
1,2,3,5-Tetrachlorobenze
1,2,3,4-Tetrachlorobenze
Pentrachlorobenzene

FIGURE 11 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

PROJECT DESCRIPTION — REGION/HQ : Ontario
WATER QUALITY BRANCH - 1987/88 — PROJECT NO: WQ-102

PROJECT TITLE: TASK FORCE, WORKING GROUP AND COMMITTEE PARTICIPATION AND SUPPORT

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management — C&P CODE 1.1

STUDY TEAM: S. Metikosh, K. Kuntz, M. Neilson, R. Stevens, C.H. Chan

GOALS:

1. To participate as members and/or chairpersons and secretaries on various national, international and interdepartmental technncial Task Forces, Working Groups and Committees formed to address specific issues related to Great Lakes Water Quality.
2. To provide technical and scientific support to these groups by supplying data and advise, as required, in the form of data summaries, detailed interpretive reports or presentations.

RATIONALE:

This is an ongoing program to fulfill WQB-OR's obligations to programs such as the Great Lakes International Surveillance Plan, the Niagara River Toxics Management Plan or other programs that are identified.

DESCRIPTION:

As of April 1, 1987 GLWQD Task Force, Working Group and Committee participation will be as follows:

C.H. Chan:	IJC Upper Great Lakes Connecting Channel and Atmospheric Deposition Task Forces.
M.N. Neilson:	IJC Lake Huron and Lake Superior Task Forces
R. Stevens:	IJC Lake Ontario and Lake Erie Task Forces
K. Kuntz:	IJC Niagara and St. Lawrence Task Force, Niagara River Sampling Protocol Work Group (Gr. A); Niagara River Interpretation Work Group (Gr. C), WQ-BIT
S. Metikosh:	IJC Lake Huron Task Force, Niagara River Sampling Protocol Work Group (Gr. A), Niagara River Data Interpretation Work Group (Gr. C), National Aquatic Biomonitoring Committee

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($'000) Sub-total	Total
PY TECH. PROF			
TOTAL PY	1.0		1.0
SALARIES	46.21		46.21
O&M	10.00		10.00
CONTRACTS	--		--
CAPITAL	--		--
TOTAL	56.21		56.21

PROJECT DESCRIPTION — REGION/HQ : Ontario
WATER QUALITY BRANCH - 1987/88 — PROJECT NO: WQ-103

PROJECT TITLE: TO UPGRADE FORT ERIE STATION SO THAT IT IS COMPATIBLE WITH NOTL STATION

NATIONAL PROGRAM NAME: Toxic Chemicals — C&P CODE 4.1

STUDY TEAM: K.W. Kuntz, H. Biberhofer

GOALS:

1. To upgrade Fort Erie Station by installing three line multipump water delivery system.
2. To replace the existing structure covering the sampling well at NOTL with a shed that will contain centrifuge, pump controllers and extraction apparatus.

RATIONALE:

System will be compatable to that at NOTL and will be better for continuous sampling if the sampling design group and sampling protocol groups recommend this procedure.

DESCRIPTION:

1. Install three polyethylene intake lines, all fittings, heat tracing and protective pipe lining to prevent damage to the lines.
2. Bury intake lines in sediment or dig trench as appropriate.
3. Install well if considered appropriate.
4. Develop building specifications for the NOTL sampling shed; arrange the removal of existing structure and construction of the new structure; and move equipment from the trailer into the new facility.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($'000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	0.15	0.20	0.35
SALARIES	6.93	7.00	13.93
O&M	2.00	13.00	15.00
CONTRACTS	--	--	--
CAPITAL	--	--	--
TOTAL	8.93	20.00	28.93

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION/HQ : Ontario
PROJECT NO: WQ-106

PROJECT TITLE: TOXIC CHEMICALS MONITORING OF THE ST. CLAIR RIVER

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE 4.1

STUDY TEAM: C.H. Chan

GOALS:

To operate two water quality monitoring stations at the inlet and outlet of the St. Clair River for the purpose of identifying and quantifying chemical pollutants in the St. Clair River.

RATIONALE:

This project is to fulfill Canada's commitment to carry out monitoring and surveillance activities in the Connecting Channels.

DESCRIPTION:

This is a continuation of the St. Clair River Monitoring Program. Suspended sediment and large volume water samples will be collected at Point Edwards and Port Lambton at a biweekly interval. Samples will be collected by lay collectors and shipped to Burlington by Courier. The samples are to be analysed for industrial chemicals, organochlorine pesticides, nutrients major ions and nutrients. Surrogate spikes will be used as QA/QC to ensure sample integrity and recovery in - 10% of samples.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($'000)	
	Sub-total	Sub-total	Total
PY TECH. PROF			
TOTAL PY	0.30	--	0.30
SALARIES	13.86	--	13.86
O&M	2.00	13.00	15.00
CONTRACTS	--	--	--
CAPITAL	--	--	--
TOTAL	15.86	13.00	28.86

SAMPLING STATIONS
ST. CLAIR RIVER

Map No.	NAQUADAT No.	Station Location
41	---	St. Clair River at outlet of Lake Huron (Point Edwards Water Treatment Plant)
42	---	St. Clair River at Port Lambton

PARAMETER LIST

Water

Nutrients: Total Phosphorus; Nitrate-Nitrite; Total Kjeldalh Nitrogen

Major Ions: Ca, Mg, SO_4, CL, Na, K; Total Alkalinity; Reactive Silica

Metal: Fe, Cu, Pb, Mn, Ni, Zn, Al (ext), Hg (ext)

Physicals: Specific Conductance; Total Non-filterable Residue; pH

WHOLE WATER AND SUSPENDED SEDIMENTS

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epoxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Araclor Total (PCB's)

chlorobutadiene
octachlorostyrene
perchlorethylene

Polyaromatic Hydrocarbons

Pyrene
Fluorene
Indene
1,2,3,4-Tetrahydronaphthalene
1-Methylnaphthalene
2-Methylnaphthalene
Beta-Chloronaphthalene
Acenaphthalene
Quinoline
Acenaphthene
Phenanthrene
Fluoranthene

Chlorinated Benzenes

1,3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3,4-Tetrachlorobenzene
Pentachlorobenzene
Hexachlorobenzene*

PROJECT DESCRIPTION — REGION/HQ : Ontario
WATER QUALITY BRANCH - 1987/88 — PROJECT NO: WQ-107/108

PROJECT TITLE: NIAGARA RIVER WATER QUALITY MONITORING

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management/Toxic Chemicals — C&P CODE 1.1 & 4.1

STUDY TEAM: K.W. Kuntz, H. Biberhofer

GOALS:
1. To continue collection of water quality samples three times per week at Fort Erie and Niagara-on-the-Lake to provide water quality records for long term trend evaluation and to provide annual estimates of material loads from Lake Erie to Lake Ontario.
2. To provide 1986 differential loading estimates for the Niagara River by October 1987.
3. To continue weekly suspended sediment and water analysis for toxic contaminants at both the source and outlets of the Niagara River.
4. To undertake special sampling and data interpretation activities related to the Niagara River as required by the Department, the River Monitoring Management Committee or IJC.
5. To prepare report by Jan./88 on original data from Apr./86-Apr./87 for Niagara River data groups pending availability of data from the lab.
6. To present paper on "Sampling and Extraction of Organic Contaminants" at AWRA Conference in Syracuse in May/87.

RATIONALE:
To fulfill Canada's surveillance and monitoring requirements on the interconnecting Channels as outlined in annexes' 11 and 12 of the 1978 GLWQA and the U.S.-Canada Niagara River Toxics Management Plan.

DESCRIPTION:
In a continuing project on the Niagara River, water samples are collected at Niagara-on-the-Lake (since 1975) and at Fort Erie (established in Oct./83) by an automatic sampler and returned weekly to Burlington for analysis. Suspended sediment and water samples will be collected weekly for organic contaminants analysis. Annual loading estimates will be available for the Lake Erie input to the Niagara River and the Niagara River load to Lake Ontario. These differential loading estimates for the Niagara River have been one of the main problems for the NRTC in interpreting previous data for the NRIC report. Considerable time will be spent analyzing data collected in previous years, to recommend sampling design and frequency to optimize information received.

	A-BASE RESOURCES: ($'000) Sub-total		NON A-BASE RESOURCES: ($'000) Sub-total		Total
C&P	1.1	4.1	1.1 & 4.1		
PY TECH.					
PROF					
TOTAL PY	0.10	0.80	0.40	1.20	2.50
SALARIES	4.62	37.00	14.00	42.00	97.62
O&M	2.00	2.00	--	13.00	17.00
CONTRACTS	--	--	--	--	--
CAPITAL	--	--	--	--	--
TOTAL	6.62	39.00	14.00	55.00	114.62

SAMPLING STATIONS
NIAGARA RIVER

Map No.	NAQUADAT No.	Station Location
1	000N02HA0019	Niagara River at Niagara-on-the-Lake
32	000N02HA0045	Niagara River at Fort Erie

PARAMETER LIST NIAGARA RIVER

Water: Nutrients: TKN, NO_3, TP
Major (Ca, Mg, K, T Alk, SO_4, Cl, Na. SiO_2)
Total Metals - Al, Ba, Cd, Co, Cr, Cu, Fe, Mn, Ma, Ni, Pb, Sr, V, Zn, Sb, Ag
Filtered Metals - Al, Ba, Cd, Co, Cu, Fe, Mn, Mo, Ni, Pb, Sr, V, Zn
Total Metals - As, Se, Hg
Alkyl Lead - Pb

SEDIMENTS: Total Metals (As, Se, Hg)
Extr. Metals ().5 N HCl) (Cd, Cu, Co, Pb, Zn, Ni, Cr)
Part C + N
Alkyl lead (Pb)

OAL - WATER - PCB's, OC!s, CB's, PAH's, volatiles, phthalates, chlorophenols, TCDD's, Furans

SEDIMENTS - PCB's, OC's, CB's, PAH's, phthalates, chlorophenols, TCDD's, Furans

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION/HQ : Ontario
PROJECT NO: WQ-109

PROJECT TITLE: ST. LAWRENCE RIVER WATER QUALITY MONITORING AT WOLFE ISLAND PERMANENT STATION.

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management

C&P CODE 1.1

STUDY TEAM: A. Sylvestre, H. Biberhofer

GOALS:

To collect daily samples to provide long term water quality records, to estimate the annual material exit loads from the Great Lakes System and to characterize seasonal variation of the water quality of the St. Lawrence River.

To collect monthly suspended sediments and whole water samples in order to measure the concentrations of organic comtaminants leaving Lake Ontario.

RATIONALE:

To fulfill Canada's surveillance and monitoring requirements in the interconnecting Channels in support of GLSIP as outlined in the 1978 Agreement.

DESCRIPTION:

Samples are collected by an automatic sampler at Wolfe Island. Water samples are sent back through a personal service contract to CCIW for chemical analysis:

Bi-weekly:	TKN, NO_2 + NO_3, TP, SRS
Weekly:	Trace metals
Composite:	Radioactivity
Bi-monthly:	Major ions

A monthly suspended sediment sampling program began in 1982 and will continue this year. At the same time a volume of 40L of whole water will be extracted with the Peter Golden extractor. The samples will be analysed for OC's, PCB's and CB's.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($'000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	0.40		0.40
SALARIES	18.48		18.48
O&M	4.00		4.00
CONTRACTS	--		--
CAPITAL	--		--
TOTAL	22.48		22.48

SAMPLING STATIONS
ST. LAWRENCE RIVER

Map No.	NAQUADAT No.	Station Location
2	000N02MA0030	St. Lawrence River

PARAMETER LIST

Water

Nutrients: Total Phosphorus; Nitrate-Nitrite; Total Kjeldalh Nitrogen

Major Ions: Ca, Mg, SO_4, CL, Na, K; K; Total Alkalinity; Reactive Silica

Metal: Fe, Cu, Pb, Mn, Ni, Zn, Al (ext), Hg (ext)

Physicals: Specific Conductance; Total Non-filterable Residue; pH

WHOLE WATER AND SUSPENDED SEDIMENTS

Organics

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Araclor Total (PCBs)

Polyaromatic Hydrocarbons

Pyrene
Fluorene
Indene
1,2,3,4-Tetrahydronaphthalene
1-Methylnaphthalene
2-Methylnaphthalene
Beta-Chloronaphthalene
Acenaphthalene
Quinoline
Acenaphthene
Phenanthrene
Fluoranthene

Chlorinated Benzenes

1,3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,3,4-Techchlorobenzene
Pentachlorobenzene
Hexachlorobenzene*

Suspend Sediments
CHN

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION/HQ : Ontario
PROJECT NO: WQ-110

PROJECT TITLE: PRECIPITATION CHEMISTRY NETWORK

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management

C&P CODE 1.1

STUDY TEAM: C.H. Chan, L.H. Perkins

GOALS:

To provide long term records of chemical composition and of atmospheric precipitation in the Great Lakes Basin.

To provide estimates of material loadings to the Great Lakes via wet precipitation.

RATIONALE:

To fulfill Canada's Surveillance and Monitoring activities on atmospheric inputs as outlined in the 1978 GLWQA.

DESCRIPTION:

This is an on-going program to monitoring chemistry of wet-precipitation in the Great Lakes Basin. Monthly composited wet-only samples will be collected from fifteen locations along the Canadian shores of the Great Lakes Basin. Samples are collected by lay collectors and shipped to NWQL for analyses. Samples will be analysed for nutrients, major ions and metals.

Data collected from this network will be used by the IJC for annual loading estimates to the Great Lakes.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($'000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	0.70	--	0.70
SALARIES	32.34	--	32.34
O&M	8.00	9.00	17.00
CONTRACTS	--	--	--
CAPITAL	--	--	--
TOTAL	40.34	9.00	49.34

SAMPLING STATIONS
PRECIPITATION CHEMISTRY
NETWORK

Map No.	NAQUADAT NO.	STATION LOCATION
15	33ON02AC0700	Squaw Bay, Sibley Provincial Park
24	33ON02BA0702	Rossport,North Shore of Lake Superior
27	33ON02BD0702	Wawa, mouth of Magpipe River
28	33ON02BF0701	Turkey Lake, Batchawana Mountain
17	33ON02CG0701	South Baymouth, Tehkummah Research Station
18	33ON02FA0700	Wiarton airport
19	33ON02FE0700	Goderich Pollution Plant
20	33ON02GH0700	Pelee Island airport
21	33ON02GC0701	Big Creek, Long Point
22	33ON02HA0700	Niagara-on-the-Lake
23	33ON02HB0705	Waterdown Road, Burlington
25	33ON02HC0701	Woodbridge, meterologivcal Research Station
26	33ON02HK0700	Weather Station at Trenton Arm Forces Base
43	33ON02MA0700	Banford Point, Wolfe Island
44	-	Port Stanley

PARAMETER LIST

Nutrients	Total Phosphorus Nitrate-Nitrite Total Kjeldahl Nitrogen
Major Ions	Ca, Mg, SO_4, CL, Na, K K Total Alkalinity Reactive Silica
Metal	Fe, Cu, Pb, Mn, Ni, Zn, Al, Ba, Cd, Co, Cr, Mo, V, Sr
Physicals:	Specific Conductance pH

PROJECT TITLE: ORGANICS IN PRECIPITATION

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management/Toxic Chemicals

C&P CODE 1.1 & 4.1

STUDY TEAM: C.H. Chan, L.H. Perkins

GOALS:

1. To determine qualitatively the level of persistent chemicals in wet precipitation in the Great Lakes Basin.

2. To operate a network of precipitation collectors to monitor persistent chemicals in atmospheric precipitation.

RATIONALE:

Relates to the implementation of Canada's Surveillance and monitoring activities on atmospheric inputs as outlined in the 1978 GLWQA.

DESCRIPTION:

This is an ongoing project developed to establish and operate a network of precipitation collectors in the Great Lakes Basin which will be used to monitor concentrations of organic contaminants in wet precipitation. In addition to operating the four existing organic precipitation collectors, WQB-OR will begin a phased in take-over of the research network previously established by NWRI. In the upcoming year, this will involve the modification of two of the NWRI network collectors to allow year round collection of organic precipitation samples, while the remaining four NWRI network collectors will be modified in 1988-89.

Samples will be removed from the sampling devices by lay collectors and shipped to Burlington for analyses.

	A-BASE RESOURCES: ($'000)		NON A-BASE RESOURCES: ($'000)	
	Sub-total		Sub-total	Total
C&P CODE	1.1	4.1	4.1	
PY TECH. PROF				
TOTAL PY	0.20	0.75	--	0.95
SALARIES	9.25	34.67	--	43.92
O&M	5.00	5.00	11.00	21.00
CONTRACTS	--	--	--	--
CAPITAL	--	--	--	--
TOTAL	14.25	39.67	11.00	64.92

SAMPLING STATIONS
PRECIPITATION CHEMISTRY
NETWORK

Map No.	NAQUADAT NO.	STATION LOCATION
15	33ON02AC0700	Squaw Bay, Sibley Provincial Park
17	33ON02CG0701	South Baymouth, Tehkummah Research Station
20	33ON02GH0700	Pelee Island airport
43	33ON02MA0700	Banford Point, Wolfe Island

PARAMETER LIST

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Araclor Total (PCB's)

Polyaromatic Hydrocarbons

Pyrene
Fluorene
Indene
1,2,3,4-Tetrahydronaphthalene
1-Methylnaphthalene
2-Methylnaphthalene
Beta-Chloronaphthalene
Acenaphthalene
Quinoline
Acenaphthene
Phenanthrene
Fluoranthene

Chlorinated Benzenes

1,3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,3,4-Techchlorobenzene
Pentachlorobenzene
Hexachlorobenzene

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION/HQ : Ontario
PROJECT NO: WQ-112

PROJECT TITLE: EVALUATION OF THE REPRESENTATIVES OF THE WOLFE ISLAND PERMANENT STATION

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management/Toxic Chemicals ECS CODE 1.1 & 4.1

STUDY TEAM: A. Sylvestre, H. Biberhofer

GOALS:

1. Determine if the Wolfe Island sampling station is representative of the South Channel.

2. Determine if the North Channel is similar to the South Channel at the exit of Lake Ontario.

RATIONALE:

Evaluation of the degree of accuracy in the fulfillment of Canada's surveillance and monitoring requirements in the interconnecting channels, in support of GLISP as outlined in the 1978 Agreement.

DESCRIPTION:

Monthly sampling (except when there is ice pack) of transects: 192N on the North Channel and 179S on the South Channel of the St. Lawrence River for the following parameters:

Nutrients:	TP, SRP, NO_3 + NO_2, TKN, NH_3, SiO_2
Major Ions:	Ca, Mg, SO_4, Cl, Na, K
Physical:	pH, Cond. spec., TOC, OD (in situ) and turbidity

Water will be collected at 1m except for deepest station where mid-depth and 3m off bottom samples will also be taken.

Collection of duplicate whole water samples will be done at 1m on the location of the deepest station on each transect for OC's and CB's analysis.

	A-BASE RESOURCES: ($'000) Sub-total		NON A-BASE RESOURCES: ($'000) Sub-total	Total
C&P CODE	1.1	4.1	4.1	
PY TECH. PROF				
TOTAL PY	0.20	0.50	--	0.70
SALARIES	9.25	23.10	--	32.35
O&M	3.50	1.00	11.00	15.50
CONTRACTS	--	--	--	--
CAPITAL	--	--	--	--
TOTAL	12.75	24.10	11.00	47.85

Sampling Stations St. Lawrence River (WQ112)

Map No.	NAQUADAT No.	Station Location
33 to 40		2 Ranges of 4 stations each at 192N in the North Channel of St. Lawrence River from Carruthers Point to Four Mile Point on Simcoe Island and from Banford Point on Wolfe Island to N.Y. Shoreline in the South Channel of the St. Lawrence River at Range 179S.

Parameters Sampled:

Monthly sampling (except when there is ice pack) of transects: 192N on the North Channel and 179S on the South Channel of the St. Lawrence River for the following parameters:

		No. of Samples
Nutrients:	TP, SRP, NO_3+NO_2, TKN, NH_3, SiO_2	130
Major Ions:	Ca, Mg, SO_4, Cl, Na, K	130
Physical:	pH, Cond. Spec., T^oC, OD (in situ) and turbidity	130

Water will be collected at 1m except for deepest station where mid-depth and 3m off bottom samples will also be taken.

Collection of duplicate whole water samples will be done at 1m on the location of the deepest station on each transect for OC's and CB's analysis.

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION/HQ : Ontario
PROJECT NO: WQ-121

PROJECT TITLE: NORTHERN BASELINE NETWORK

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE 1.3

STUDY TEAM: R. McCrea and J. Fischer

GOALS:

1. Prepare a report, based on four years data, describing major ion and heavy metal chemistry in the five major rivers of Ontario Arctic Watershed.
2. Review organic contaminants in mature northern pike and forage fish collected from the Moose River in 1986 to assess effectiveness of past sampling and analytical protocols with NWRI, and recommend future sample needs.

RATIONALE:

Ontario's Arctic Watershed comprises over half the land mass of Ontario. The rivers, which drain the region, represent an important resource to the native population and provide an essential source of nutrients to their estuaries, which are of major national and international as nesting and feeding areas for migratory birds. The data base, is derived from water sample collection adjacent to Indian Reserves, and indicative of one basin with several major industries (mining, pulp and paper) and four other basins with little or no direct point sources.

DESCRIPTION:

1. Preparation of a water chemistry report by Feb./88 on the Moose, Albany, Attawapiskat, Winisk and Severn Rivers will require considerable time and effort preparing graphs, figures, interpreting data and report writing. (Goal 1).
2. Results of the organic contaminant review will be presented in a combined report with Ottawa River data by Oct./87, as indicated in project 135. (Goal 5).
3. Attend a WQB sponsored "northern workshop" to discuss efficient and effective monitoring designs for northern ecosystems; establishment of guidelines and objectives, determination of issue identification, information and research needs. Themes to be discussed include urban development mining and hydrocarbon contamination. (Yellowknife, May/87).

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($'000)	
	Sub-total	Sub-total	Total
PY TECH. PROF			
TOTAL PY	0.20		0.20
SALARIES	9.24		9.24
O&M	4.00		4.00
CONTRACTS	--		--
CAPITAL	--		--
TOTAL	13.24		13.24

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION/HQ : Ontario
PROJECT NO: WQ-122

PROJECT TITLE: NORTHWESTERN ONTARIO

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE 4.1

STUDY TEAM: J. Merriman, (Contact), J. Fischer

GOALS:

1. Maintain a network of four stations in Northwestern Ontario for monthly trace organic contaminant sampling. (Merriman, Fischer)
2. Submit a final draft to IWD by June on Network Data between 1979-85. (Merriman).
3. Prepare a summary report on field work (water and suspended sediment) carried out in 1986. (Merriman).
4. Carry out duties as required for the Rainy River Work Group and the Rainy River Water Pollution Control Board. (Merriman).
5. (Tentative). Carry out field survey on the Rainy River based on findings from 1986 field work. (Merriman, Fischer).

RATIONALE:

These rivers are of international and interprovincial significance. Monitoring trace organic contaminants will provide a long term database for future reference.

DESCRIPTION:

1. Four stations on the Rainy, English and Winnipeg Rivers will be sampled monthly by local collectors. Samples will be analysed for OC's, PCB's, chlorobenzenes and PAH's. Ongoing (500 hrs.).
2. A final report on monitoring data from 1979-85 will be completed with recommendation on future monitoring activities. Target data is June/87.
3. A summary report will be completed on field work carried out in 1986 by Jan./88.
4. Attend Rainy River Work Group meetings and provide input for the Rainy River Water Pollution Control Board's annual report to the IJC. On going.
5. Follow-up survey to be completed on Rainy River designed around findings from 1986 work. This work is as yet undefined, pending results from 1986.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($'000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	0.50		0.50
SALARIES	23.10		23.10
O&M	7.00		7.00
CONTRACTS	--		--
CAPITAL	--		--
TOTAL	30.10		30.10

SAMPLING STATIONS
NORTHWESTERN ONTARIO NETWORK

Map No.	NAQUADAT NO.	STATION LOCATION
5	000N05PC0002	Rainy River at outlet of Rainy Lake
6	000N05PD0001	Rainy River at outlet of Lake of the Woods
7	000N05PE0002	Winnipeg River at Whitedog Falls Generating Station
8	000N05QE0002	English River at Caribou Falls Generating Station

PARAMETER LIST

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Araclor Total (PCBs)

PROJECT TITLE: PUKASKWA NATIONAL PARK

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE 1.3

STUDY TEAM: R. McCrea, D. Warry, J. Fischer, Student

GOALS:

1. Establish baseline water quality of inorganic constituents in the White and Pukaskwa Rivers. (McCrea, Fischer)
2. Assess organic and inorganic contaminants in water and sediments in the White and Puskaskwa Rivers. (McCrea, Fischer)
3. Co-ordinate bacti sampling in the White River and fish tissue sampling in the White and Puskaskwa Rivers for Parks Canada. (McCrea)
4. Prepare a data summary of all available 1987 data. (McCrea)
5. Plan and co-ordinate future joint sampling programs with Parks Canada and other agencies. (Warry, McCrea)

RATIONALE:

Puskaskwa National Park has been identified as an area of national interest with regard to the National Water Quality Assessment Program of the Water Quality Branch. This project provides the resources to collect part of the information required under the National Water Quality Agreements umbrella for Ontario.

DESCRIPTION:

1. Collection of water samples by Parks Canada Personnel, on a monthly basis, from the White, East Pukaskwa and Pukaskwa Rivers for major ion, nutrient and trace metal analyses. (Goal 1)
2. Two surveys will be conducted in July and Sept. to collect bottom sediment from each of the above rivers; large volume aqueous extracts and suspended sediment by centrifugation from the White and Puskaskwa Rivers; and seston using sediment traps from the White River on roughly a monthly basis. The samples will be subjected to trace metal and/or GC/MS investigative analyses. (Goal 2)
3. All available data will be summarized and a preliminary report will be prepared for submission to Parks Canada. (Goal 4)
4. Contacts will be established with other agencies in order to develop in more detail a long term work plan for the water quality assessment of the park.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($'000) Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	1.00		1.00
SALARIES	46.21		46.21
O&M	15.00		15.00
CONTRACTS	--		--
CAPITAL	--		--
TOTAL	61.21		61.21

Sampling Stations Pukaskwa National Park

Map No.	NAQUADAT No.	Station Location
9	-	White River
10	-	Pukaskwa River
11	-	East Pukaskwa River

Parameter List

Water

i) Metals, Dissolved: 42 samples — Antimony, Aluminum, Arsenic, Barium, Berillium, Cadmium, Cobalt, Chromium, Copper, Iron, Manganese, Molybdenum, Nickel, Lead, Lithium, Selenium, Strontium, Vanadium and Zinc.

Total — 42 samples as above plus mercury (ext.)

ii) Major Ions: 30 samples — Alkalinity, Calcium, Chloride, Magnesium, Potassium, Silica, Sodium, Sulphate.

iii) Nutrients: 30 samples — Total Kjeldahl nitrogen, Nitrate + Nitrite, Phosphorus, Dissolved Organic Carbon.

iv) Physicals: 30 samples — pH, Conductivity, Colour, Residue, Turbidity, D.O.

v) Cyanide 30 samples

Sediments (Suspended and Bottom)

Max. 15 samples

Samples will be analyzed for particule size, particulate organic carbon, total and non-residual aluminum, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel and zinc; and total arsenic and mercury.

4 Samples GC/MS Scan

Seston

Max. 15 samples

Samples will be analyzed for particule size, particulate organic carbon, total and non-residual aluminum, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel and zinc; and total arsenic and mercury.

4 Samples GC/MS Scan

PROJECT TITLE: WATER QUALITY AGREEMENTS

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE 1.3

STUDY TEAM: D. Warry, R. McCrea, J. Merriman, F. Philbert

GOALS:

1. To conduct at least 4 negotiation meetings with Ontario by March 31/88.
2. To prepare a draft Water Quality Agreement with Ontario by March 31/88.
3. To prepare a technical plan to use as a basis for a formal water quality agreement with Ontario.
4. To assist in the preparation of the National Water Quality Assessment Program and to carry out specific assignments in support of the Water Quality Agreements Task Force.

RATIONALE:

DESCRIPTION:

Work will be carried out under the direction of a number of committees such as the Federal-Provincial Agreements Task Force, the Canada-Ontario Water Quality Agreement Technical and Steering Committees and the National Federal-Provincial Water Quality Agreement Steering Committee. Planned end products include the preparation of a draft water quality agreement between Canada and Ontario, a technical plan for the same agreement and a final draft of a National Water Quality Assessment Strategy. It is also planned to present a paper at the 8th Annual Meeting of the Society of Environmental Toxicology and Chemistry.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($'000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	0.70		0.70
SALARIES	32.34		32.34
O&M	5.00		5.00
CONTRACTS	--		--
CAPITAL	--		--
TOTAL	37.34		37.34

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION/HQ : Ontario
PROJECT NO: WQ-130

PROJECT TITLE: WATER QUALITY BRANCH REGIONAL MANAGEMENT AND ADMINISTRATION

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management/Water Quality Management Data/Toxic Chemicals

C&P CODE 1.1, 1.3, 4.1.

STUDY TEAM: F.J. Philbert, N.D. Warry, S. Metikosh, M. Jurkovic

GOALS:

1. To manage and administer the Branch's operation effectively and efficiently.
2. To respond to requests for briefing notes, information, comments, reviews and various other items, none of which can be accurately predicted at this time.
3. To prepare long term operational plans, detailed forecasts, budget summaries, resource reallocations and other required information summaries and statistics.
4. To provide typing and administrative support to WQB-OR.

RATIONALE:

This project relates to the WQB mandate to maintain effective and efficient water quality monitoring and assessment programs in the region.

DESCRIPTION:

To achieve goal 2 will require:
a) The preparation of all necessary background material for each report.
b) Participation in meetings with the provinces, H.Q. staff, IJC staff, other regional and national managers.

To achieve goal 3 will require:
a) Review of pertinent documentation available
b) Co-ordination with headquarters and regional staff re necessary requirements, goals, etc.

To achieve goal 4 will require:
a) Ongoing co-ordination and support

	A-BASE RESOURCES: ($'000) Sub-total		NON A-BASE RESOURCES: ($'000) Sub-total		Total
C&P CODE	1.1	4.1	1.1	4.1	
PY TECH. PROF					
TOTAL PY	1.25	1.20	--	--	2.45
SALARIES	57.76	55.47	--	--	113.23
O&M	11.80	24.60	--	--	36.40
CONTRACTS	--	--	--	--	--
CAPITAL	15.70	--	10.00	5.00	30.70
TOTAL	85.26	80.07	10.00	5.00	180.33

PROJECT TITLE: OTTAWA RIVER

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE 4.1

STUDY TEAM: J. Merriman, (Contact), R. McCrea, J. Fischer, D. Warry

GOALS:

1. To submit to the IWD Technical Series a report describing water quality conditions in the National Capital Region of the Ottawa River. (Merriman)
2. To describe, with NWRI, the concentrations of contaminants in water, sediment and selected biota from the South Nation River area of the Ottawa River. (Merriman)
3. Participate on Ottawa River Technical Workgroup and provide advice to Ottawa River Coordinating Committee. (Warry, McCrea, Merriman)
4. Complete Interpretive Report on Lemieux Island Data. (McCrea, Fischer)
5. Complete internal report on chemical investigative work on young-of-the-year and top predator fish done in 1986 at four sites on Ottawa River. (McCrea)

RATIONALE:

The Ottawa River is a very important interprovincial river. As such, WQB undertakes work on the river in conjunction with other provincial agencies under the direction of the Ottawa River Coordinating Committee.

DESCRIPTION:

1. A report will be completed on the 84 NCR surveys detailing changes in water quality if any as a result of remedial measures in Quebec. Target date Oct./87.
2. Joint report with NWRI on findings from 85 and 86 on water sediment and biota with recommendations for a sampling strategy. Target date Mar./88.
3. Participation as required on Technical Working Group. Ongoing.
4. Report on Lemieux Island water quality data. Target date Dec./87.
5. Internal report on chemical investigations in fish from four sites on the Ottawa River with recommendations on monitoring chemicals of concern. Target date Oct./87.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($'000)	
	Sub-total	Sub-total	Total
PY TECH. PROF			
TOTAL PY	0.90		0.90
SALARIES	41.59		41.59
O&M	8.00		8.00
CONTRACTS	--		--
CAPITAL	--		--
TOTAL	49.59		49.59

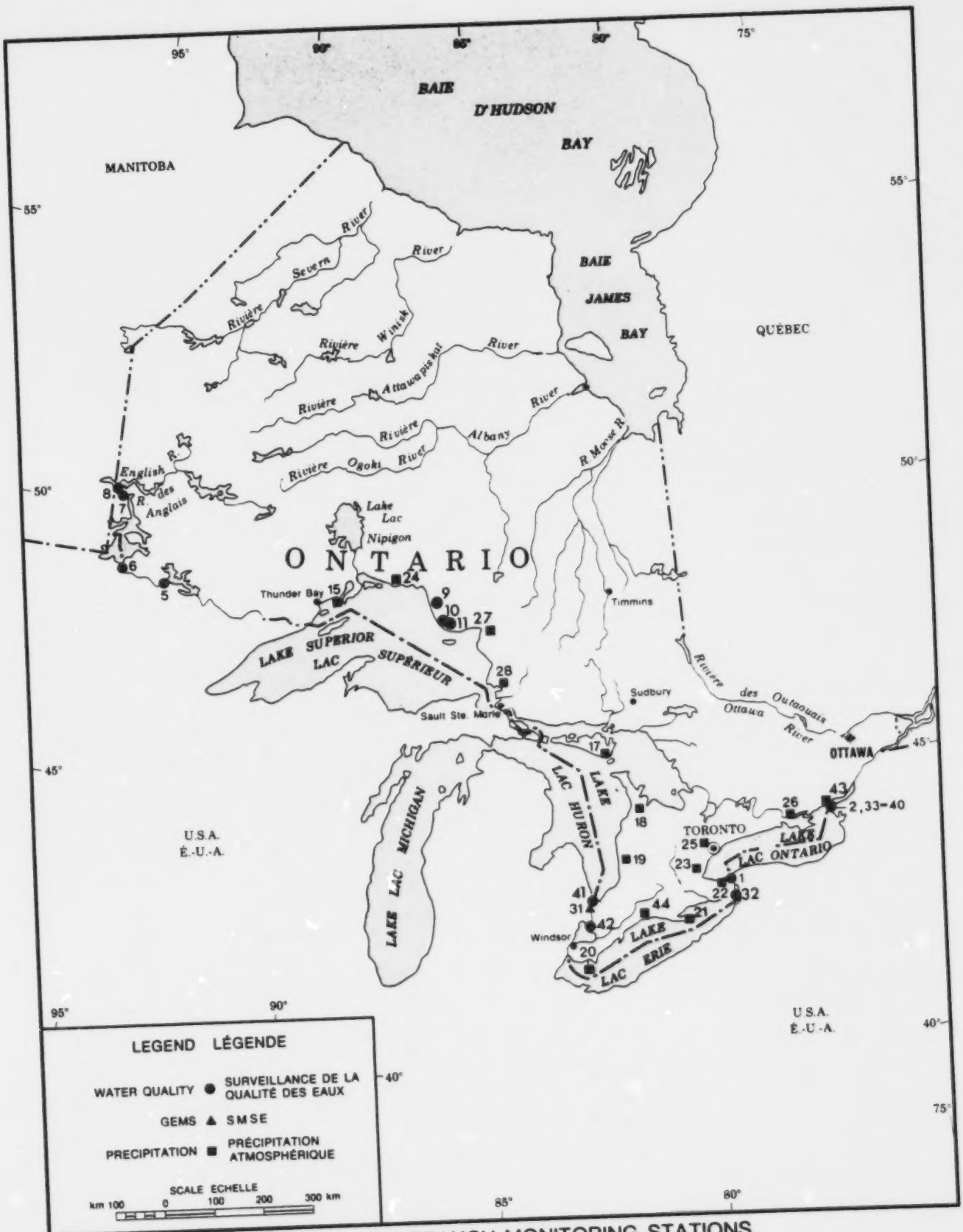


FIGURE 12 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

D.4 WESTERN AND NORTHERN REGION

Région du l'Ouest et du Nord

1987/88
Western and Northern Region Budget Allocation
July 24, 1987

RC/AE	PY	SAL	O&M	CAP	SUB-TOT	O&M REV	CWA O&M	TOTAL
3421								
1112	8.0	322.8	58.0	15.0	395.8	-	-	395.8
1312	10.0	354.0	293.7	48.5	696.2	127.5	-	696.2
V.N.	-	-	-	-	-	37.0	-	
4100	7.0	185.3	60.0	32.0	277.3	-	-	277.3
3422								
1110	-	-	-	-	-	-	165.0	165.0
TOTAL								
W.Q.	25.0	862.1	411.7	95.5	1369.3	164.5	165.0	1534.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
301-87 Interjurisdictional Monitoring by WRB

SUBMITTER - 0001
C&P PROGRAM - 1.1* - Canada-U.S. and Interjurisdictional Waters
DURATION - Ongoing

OBJECTIVES To conduct monthly or time of visit water quality surveys at designated interjurisdictional locations; to prepare the data collected from these sites for the detailed data and water quality interpretive reports.

RATIONALE This project contributes to the administration of the Boundary Waters Treaty of 1909 by making available water quality data from three international river systems. As well, samples are collected from four remote northern interprovincial rivers.

DESCRIPTION Monthly or time of visit samples are collected for a wide spectrum of parameters by Water Survey of Canada. The governments concerned are notified of potential and existing problems. Depending on the magnitude of the problem, External Affairs may be notified. The data are reviewed on an annual basis to assess the relative quality of the boundary streams.

COORDINATOR(S)
Block (Alta.) Chacko (Man.) Crosley (Sask.)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.04		0.04
	PY Tech		0.7	0.11		0.18
	Salary		2.3	5.5		8.8
	O & M		1.1	3.7		4.8
	Capital		0.3	1.9		2.2
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.07	0.15		0.22
Total Dollars		9.3	3.7	11.1		24.1

* Affiliated C&P Program(s) - 1.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
301-87 Interjurisdictional Monitoring by WRB

SAMPLING MATRIX

Schema	LAB	Parms	Stns 52,54	Stn 53	Stns 59,61,62	Stn 60	Total
SA2	F	Phys(F)	M	M	V	V	37
SB1	F	Coliform	M	M			19
SC1	B	MajorIon	M	M	V	V	37
SC2	S	Phys(L)	M	M	V	V	37
SC3	S	NFR	M	M	V	V	37
SD2	S	Nutrients	M	M	V	V	37
SE1	B	T Metals		M	V	V	26
SE3	B	Fe-Mn(Ext)		M	V	V	26
SF3	B	As-Se(L)	M	M	V	V	37
SF4	S	B(L)	M	M	V	V	37
SG1	S	Cn		M			8
SH2	B	Herbs(New)		M		V	12
SH5	B	OC-PCB		M		V	12
SH8	S	Phenol		M			8

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
52	Battle Creek near International Boundary	00SA11AB0005	M
53	Frenchman River at the 49th Parallel	00SA11AC0002	M
54	Lodge Creek near Willow Creek	00SA11AB0007	M
59	Nelson River near mouth of Weier River	00MA05UH0001	V
60	Hayes River below Junction with God's River	00MA04AB0001	V
61	Churchill River above Red Head Rapids	00MA06FD0002	V
62	Cochrane River near Brochet Manitoba	00MA06DA0001	V

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
304-87 Interjurisdictional Monitoring by WQB

SUBMITTER - 0003
C&P PROGRAM - 1.1* - Canada-U.S. and Interjurisdictional Waters
DURATION - Ongoing since 1978

OBJECTIVES To report on the water quality at interjurisdicational stations and provide data for the administration of the Boundary Waters Treaty and Federal/Provincial Water Management programs.

RATIONALE The Water Quality Branch contributes to the administration of the Boundary Waters Treaty of 1909 by making available water quality data obtained at border locations of international river systems.

DESCRIPTION Samples are collected monthly for a wide variety of parameters from 14 interjurisdictional stations. The data are verified before dissemination. Unusual values may be followed up with re-surveys. The governments concerned are notified of potential and real problems. Depending on the magnitude of the international concerns, External Affairs may be notified. The data are reviewed on an annual basis for publication.

COORDINATOR(S)
Block (Alta), Chacko (Man), Crosley (Sask)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.17	1.00		1.17
	PY Tech		0.32	1.20		1.32
	Salary		17.6	81.5		99.1
	O & M		7.9	30.7		38.6
	Capital		2.2	15.4		17.6
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.49	1.55		2.04
Total Dollars		79.0	27.7	127.7		234.4

Affiliated C&P Program(s) - 1.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
304-87 Interjurisdictional Monitoring by WQB

INDICATORS - 1.1 A-1-f, 1.3 B-1-b
PRIORITY - Sample Turnaround Time 90 Days

DISSEMINATION OF LABORATORY DATA REPORTS

1 Project Coordinator(s)
2 NAQUADAT
3 WESTORE
4 Manitoba data - D. Brown,
Environmental Management Service,
Building 2, Box 7
139 Tuxedo Avenue,
Winnipeg, Manitoba R3N 0H6
5 Saskatchewan data - D. Fast
Director Water Pollution Control Branch
Saskatchewan Environment,
3085 Albert Street
Regina, Saskatchewan
6 Alberta data - A. Masuda,
Alberta Environment,
9820 - 106th Street,
Edmonton, Alberta T2K 2S6

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Revise project description	April	
2 Data verification		Within 90 days of sampling
3 Publish data		Data is published yearly as per work plan

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
1	Milk River at Eastern Crossing of International Boundary	00AL11AA0003	M
2	Milk River at Western Crossing of International Boundary	00AL11AA0002	M
3	North Milk River at International Boundary	00AL11AA0001	M
4	St. Mary River near International Boundary	00AL05AE0001	M
5	Belly River at Highway # 6	00AL05AD0060	M
6	Waterton River at Highway # 6	00AL05AD0005	M
7	East Poplar River at International Boundary	00SA11AE0008	M
10	Souris River near Glen Ewen	00SA05ND0001	M
12	Souris River at Coulter	00MA05NF0001	M

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
304-87 Interjurisdictional Monitoring by WQB

14	Pembina River at Windygate	00MA050B0001	M
16	Roseau River at Gardenton	00MA050D0001	M
19	Pipestone Creek at Highway 255	00MA05NG0013	M
20	Winnipeg River at Pointe du Bois	00MA05PF0022	M
21	Manigotagan River at Highway 304	00MA05RA0004	M

SAMPLING MATRIX

Schema	LAB	Parms	Stns 10, 19,20	Stns 1,12	Stns 4,6, 14,16	Stns 2,3, 5,21	Stn 7	Stn 21	Total
SA1	F	Phys(F)	M	M	M	M	M	M	180
SB1	F	Coliform	M	M	M	M	M	M	180
SB3	S	Chlor(F)	M	M	M	M	M	M	180
SC1	B	Majorion	M	M	M	M	M	M	180
SC2	S	Phys(L)	M	M	M	M	M	M	180
SC3	S	NFR	M	M	M	M	M	M	180
SD1	S	Nutrients	M	M	M	M	M	M	180
SE1	B	T Metals	M	M	M		M	M	132
SE2	B	Fe-Mn(Diss)	M	M	M	M	M	M	180
SE4	B	Al(Ext)					M		12
SE5	B	Al(Diss)					M		12
SE6	B	Cr(T)					M		12
SE7	B	Hg(T)	M	M	M	M	M	M	180
SF1	B	As-Se(F)	M	M	M	M	M	M	180
SF2	S	B(F)	M	M	M	M	M	M	180
SG1	S	Cn	M	M	M		M		120
SH2	B	Herbs(New)	M	M	M		M		120
SH3	B	Picloram		V	V		V		56
SH4	B	Herbs(Neut)		V					16
SH5	B	OC-PCB	M	M	M		M		120
SH8	S	Phenol	M	M	M		M		120

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
306-87 International Automatic Water Quality Monitoring

SUBMITTER - 0140
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES (1) To provide continuous surveillance of the Red River at the Canada - U.S. border in order to detect and document the effect of any industrial and municipal waste spills and other pollution sources originating in the U.S. (2) To acquire water quality data in order to meet obligation of the Red River Pollution Control Board, IJC.

RATIONALE Under IJC the Red River monitoring was established in 1968 to provide a continuous surveillance of the water quality at the Canada - U.S. border at Emerson. Since 1977, the potential effect of the Garrison Diversion on the Red River water quality has provided an additional reason for maintaining this monitor.

DESCRIPTION A Schneider Robot RM25 monitor is operated on a continuous basis on the Red River at Emerson. Parameters measured are DO, pH, conductivity, chloride and temperature. Data are collected and transmitted using a LaBarge DCP via GOES satellite and stored at Camp Springs, MD. These data are retrieved and decoded by the Branch computer in Regina. Computed monthly data are distributed to various agencies. Monthly samples are also collected to allow monitor to laboratory comparisons, and, to supplement the monthly reports with complete parametric coverage. Included in this project will be the installation and operation of a Schneider Model MCT-2 data storage and transmission unit. Installation and initial calibration by the supplier may be required.

COORDINATOR(S)
Chacko

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.20		0.20
	PY Tech		0.03	0.50		0.53
	Salary		1.1	24.8		25.9
	O & M		0.6	6.5		7.1
	Capital		0.2	2.0		2.2
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.03	0.50		0.53
Total Dollars		10.4	1.8	33.3		45.5

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
306-87 International Automatic Water Quality Monitoring

SAMPLING MATRIX

Schema	LAB	Parms	Stn 15	Total
SA1	F	Phys(F)	M	12
SB1	F	Coliform	M	12
SB3	S	Chlor(F)	M	12
SC1	B	Major Ion	M	12
SC2	S	Phys(L)	M	12
SC3	S	NFR	M	12
SD1	S	Nutrients	M	12
SE1	B	T Metals	M	12
SE2	B	Fe-Mn(Diss)	M	12
SE4	B	Al(Ext)	M	12
SE5	B	Al(Diss)	M	12
SE6	B	Cr(T)	M	12
SE7	B	Hg(T)	M	12
SF1	B	As-Se(F)	M	12
SF2	S	B(F)	M	12
SG1	S	Cn	M	12
SH2	B	Herbs(New)	M	12
SH3	B	Picloram	M	12
SH4	B	Herbs(Neut)	M	12
SH5	B	OC-PCB	M	12
SH8	S	Phenol	M	12

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
15	Red River at Emerson	00MA050C0001	M

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
307-87 National Radionuclide Monitoring

SUBMITTER - 0007
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - Ongoing since 1980.

OBJECTIVES To measure and assess the significance of radionuclides in waters of federal interest.

RATIONALE Radiation emitted by radionuclides is harmful to humans, causing damage at both the cellular and molecular levels. The main effect on the individual at low dose levels is the induction of cancer, such as leukemia, while very high dose levels result in death. In addition to somatic changes which affect the individual, genetic changes can also occur which affect the offspring for several generations.

DESCRIPTION Samples are composited to make quarterly and annual samples for analysis. Four (4) litre samples are collected monthly in polyethylene containers and acidified with 8 ml. concentrated HCL as a preservative. From these monthly samples a composite five (5) litre sample is sent to NWRI for analysis.

Stations monitored under this project are included in other projects as follows: Souris River at Coulter and East Poplar River at International Boundary in Project 304, and Red River at Emerson in Project 306. Samples from the East Poplar, Souris and Red River sites are analyzed quarterly. To date, none of the sampling stations in the Western and Northern Region have exhibited significant trends in the concentration of radionuclides in surface waters. This has given rise to a reassessment of the program, as described below.

COORDINATOR(S) - B. Crosley

RESOURCES ($ 000.)

		Nat Lab	Reg Lab	Field	Admin	Total
A Base	PY Prof			0.01		0.01
	PY Tech			0.04		0.04
	Salary			1.7		1.7
	O&M			2.0		2.0
	Cap					
PY Total				0.05		0.05
Total Dollars				3.7		3.7

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
312-87 Northern Saskatchewan Monitoring Agreement

SUBMITTER - 0001
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES

1. To conduct quarterly water quality surveys at sites identified in the agreement.

2. To prepare quarterly data reports for the Saskatchewan Government.

RATIONALE The Branch and Saskatchewan DOE both have need of ongoing water quality data for these interjurisdictional river systems. The Saskatchewan and Canadian governments, recognizing an opportunity to reduce monitoring costs in Northern Saskatchewan, have negotiated a cost-sharing agreement.

DESCRIPTION Samples are collected quarterly from 5 river locations in N. Saskatchewan and analyzed by WQB. Radionuclide samples are collected as well, with analyses done by SRC. In addition, samples of lake water and snow are collected from approximately 30 locations at various times of the year to provide information on LRTAP. Analyses of these samples are performed by SRC. Sites are accessible by air only. During 1987-88, collection will be done by WQB. The data are reviewed and reported quarterly.

COORDINATOR(S) - Crosley

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof					
	PY Tech			0.03		0.03
	Salary			1.00		1.0
	O & M			0.9		0.9
	Capital					
Recov.	PY Prof					
	PY Tech		0.05	0.09		0.14
	Salary		1.7	2.9		4.6
	O & M		0.8	15.7		16.5
	Capital		0.2	0.5		0.7
	Total	2.7	2.7	19.1		24.5
PY Total			0.05	0.12		0.17
Total Dollars		2.7	2.8	21.0		26.5

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
312-87 Northern Saskatchewan Monitoring Agreement

SAMPLING MATRIX

Schema	LAB	Parms	Stns 64,65,66,67	Stn 68	Total
SA2	F	Phys(F)	Q	Q	20
SB4	S	Chlor(L)	Q	Q	20
SC1	B	Majorion	Q	Q	20
SC2	S	Phys(L)	Q	Q	20
SC3	S	NFR	Q	Q	20
SD2	S	Nutrients	Q	Q	20
SD4	S	DIC	Q	Q	20
SE1	B	T Metals	Q	Q	20
SE3	B	Fe-Mn(Ext)	Q	Q	20
SE6	B	Cr(T)	Q	Q	20
SE8	B	Ag(Ext)	Q	Q	20
SE9	B	Mo(Ext)	Q	Q	20
SF3	B	As-Se(L)	Q	Q	20
SF4	S	B(L)	Q	Q	20
SG1	S	Cn	Q	Q	20
SH8	S	Phenol		Q	4

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
64	Fond du Lac River at outlet of Black Lake	00SA07LC0001	Q
65	Beaver River above Beauval	00SA06AG0004	Q
66	Geike River below junction with Wheeler River	00SA06DA0001	Q
67	Churchill River at Otter Rapids	00SA06CD0001	Q
68	Churchill River near Patuanak	00SA06BB0004	Q

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
313-87 Formalized Water Quality Agreement Development

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES To negotiate and develop formalized agreements with the provinces of Manitoba, Saskatchewan and Alberta; to annually review and update these agreements. To take part as appropriate in similar negotiations regarding the NWT.

RATIONALE In 1982 Water Quality Branch was directed by the Federal Cabinet to negotiate water quality agreements with the provinces. These agreements will fullfill the needs of both the provinces (data aquisition for management purposes) and the federal government (National Water Quality Assessment).

DESCRIPTION Negotiations with the province of Alberta commenced in 1983 with a view to replacing the ad hoc arrangement with a formalized agreement. This formalized agreement will contain provisions for the sharing of field and analytical work. As well, other joint activities such as quality control/quality assurance studies, interpretive reporting and sediment and biological surveys will take place. Similar agreements are being negotiated with Manitoba (started in 1984), Saskatchewan (started in 1985), and concerning the NWT (started in 1986-'87).

COORDINATOR(S) - Gummer, Vaughan

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	TOTALS
A Base	PY Prof			1.35		1.35
	PY Tech			0.1		0.1
	Salary			60.6		60.6
	O & M			9.5		9.5
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				1.45		1.45
Total Dollars				70.1		70.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
314-87 National Parks Monitoring Agreement

SUBMITTER - 0417
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES To conduct monthly surveys at selected sites within the Rocky Mountain National Parks; to prepare detailed data reports on data obtained in 1983,1984 and 1985; to develop an Agreement with Parks Canada for FY 88/89; to prepare an interpretive statement on monitoring data collected during the period 1980 to 1984.

RATIONALE Parks Canada requested that the Branch establish and maintain a water quality network for the purpose of establishing and maintaining a baseline of surface water quality to optimize the use of Park waters. In addition, the Branch has an interest in these data since both the North and South Saskatchewan and the Athabasca Rivers originate in the Parks.

DESCRIPTION Under the terms of the Agreement the Branch is committed to monthly monitoring for major ions, nutrients, bacteria and metals at five sites (with some IWD interest) in the Rocky Mt. Parks. The project is reviewed annually in cooperation with Parks Canada and is renewable with or without modification. Data are verified on a monthly basis and reported annually to Parks Canada.

COORDINATOR(S) - Block

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.03		0.03
	PY Tech		0.09	0.25		0.34
	Salary		3.0	9.4		12.4
	O & M		1.5	10.5		12.0
	Capital		0.7	2.8		3.5
	Total	10.0				36.3
Recov.	PY Prof			0.07		0.07
	PY Tech		0.06	0.18		0.24
	Salary		2.0	8.8		10.8
	O & M		1.0	4.4		5.4
	Capital			2.3		2.3
	Total	6.6				25.1
PY Total			0.15	0.48		1.04
Total Dollars		16.6	8.2	38.2		63.0

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
314-87 National Parks Monitoring Agreement

SAMPLING MATRIX

Schema	LAB	Parms	Stations 45, 48	Stations 44,46,47	Total
SA1	F	Phys(F)	M	M	60
SB1	F	Coliform	M	M	60
SB2	F	Strep	M	M	60
SB3	S	Chlor(F)	M	M	60
SC1	B	Majorion	M	M	60
SC2	S	Phys(L)	M	M	60
SC3	S	NFR	M	M	60
SD1	S	Nutrients	M	M	60
SE1	B	T Metals	M	-	24
SE2	B	Fe-Mn(Diss)	M	M	60
SE7	B	Hg(T)	M	M	60
SF1	B	As-Se(F)	M	M	60
SF2	S	B(F)	M	M	60
SG1	S	Cn	M	-	24
SH2	B	Herbs(New)	M	-	24
SH3	B	Picloram	V	-	16
SH5	B	OC-PCB	M	-	24
SH8	S	Phenol	M	-	24

V = April to November inclusive.

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
44	Bow River at Highway # 1 above Lake Louise	00AL05BA0011	M
45	Bow River 4.5 Km. above Canmore	00AL05BE0013	M
46	North Saskatchewan River at Whirlpool Point	00AL05DA0001	M
47	Athabasca River at Athabasca Falls	00AL07AA0015	M
48	Athabasca River at Highway # 16 below Snaring River	00AL07AA0023	M

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
315-87 Prairie Provinces Water Board Monitoring

SUBMITTER - 0462
C&P PROGRAM - 1.1* - Interjurisdictional Water Management
DURATION - Ongoing since 1978

OBJECTIVES

1. To conduct monthly water quality surveys at eleven interprovincial locations.

2. To prepare monthly detailed data reports for the PPWB.

RATIONALE The Branch, in order to fulfill its mandate and the terms of an agreement with the Prairie Provinces Water Board, is required to monitor the quality of selected interprovincial rivers.

DESCRIPTION A total of eleven interprovincial sites are sampled monthly by the branch for a wide spectrum of parameters. The information obtained is verified monthly and reports are prepared for the PPWB. These stations represent river systems in both the Canadian Shield and Plains physiographic regions of the Western and Northern region.

COORDINATOR(S) - Crosley (Man., Sask.), Block (Alta.)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.14	1.10		1.24
	PY Tech		0.27	0.85		1.12
	Salary		14.7	74.4		89.1
	O & M		6.6	20.8		27.4
	Capital		1.8	10.4		12.2
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.41	1.39		1.80
Total Dollar		161.8	23.1	105.6		290.5

* Affiliated C&P Program(s) - 1.3, 4.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
315-87 Prairie Provinces Water Board Monitoring

INDICATORS - 1.1 A-1-i,j,k
PRIORITY - Relative Rank 2. Sample Turnaround Time 60 Days

DISSEMINATION OF LABORATORY DATA REPORTS

1 Project Coordinator(s)
2 WESTORE
3 NAQUADAT
4 PPWB, Motherwell Building, Regina, Saskatchewan
5 Director, Water Pollution Control Branch, Saskatchewan Environment
6 M. Morelli, Manitoba DMREM

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Provide finalized data to users within 60 days of collection	ongoing	
2 Verified data for calendar year to be entered on NAQUADAT	March 1	

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
22	South Saskatchewan River at Highway # 41	00AL05AK0001	M
23	Red Deer River near Bindloss	00AL05CK0001	M
24	Beaver River at Beaver Crossing	00AL06AD0001	M
25	Churchill River below Wasawakasik Lake	00SA06EA0003	M
27	Carrot River at Turnberry	00SA05KH0002	M
28	Battle River near Unwin	00SA05FE0001	M
29	Red Deer River near Erwood	00SA05LC0001	M
30	Qu'Appelle River 3.2 Km. South of Welby	00SA05JM0014	M
31	Assiniboine River at Highway # 8 below Kamsack	00SA05MD0002	M
32	Saskatchewan River above Carrot River	00MA05KH0001	M
94	North Saskatchewan River at Lea Park	00AL05EF0001	M

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
315-87 Prairie Provinces Water Board Monitoring

SAMPLING MATRIX

Schema	LAB	Parms	Stns 22,30, 31,32	Stns 23,27, 28,94	Stns 25,29	Stn 24	Total
SA1	F	Phys(F)	M	M	M	M	132
SB1	F	Coliform	M	M	M	M	132
SB3	S	Chlor(F)	M	M	M	M	132
SC1	B	Majorlon	M	M	M	M	132
SC2	S	Phys(L)	M	M	M	M	132
SC4	S	NFR-NFFR	M	M	M	M	132
SD1	S	Nutrients	M	M	M	M	132
SD3	S	P Ortho	M	M	M	M	132
SE1	B	T Metals	M	M	M	M	132
SE2	B	Fe-Mn(Diss)	M	M	M	M	132
SE4	B	Al(Ext)	M	M	M	M	132
SE5	B	Al(Diss)	M	M	M	M	132
SE6	B	Cr(T)	M	M	M	M	132
SE7	B	Hg(T)	M	M	M	M	132
SF1	B	As-Se(F)	M	M	M	M	132
SF2	S	B(F)	M	M	M	M	132
SG1	S	Cn	M	M	M	M	132
SG2	S	Cn(Free)	M	M	M	M	132
SG3	S	Sulfide		V		V	20
SH1	B	Herbs(Old)	M	M	M	M	132
SH2	B	Herbs(New)	M	M	M	M	132
SH3	B	Picloram	M	M	M	M	132
SH4	B	Herbs(Neut)	M	M	M	M	132
SH5	B	OC-PCB	M	M	M	M	132
SH6	B	WOP1WOP2	V	V			64
SH8	S	Phenol	M	M	M	M	132

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
317-87 East Poplar River Bilateral Monitoring Agreement

SUBMITTER - 0001
C&P PROGRAM - 1.1 - Canada-U.S. and Interjurisdictional Waters
DURATION - Ongoing

OBJECTIVES To provide ongoing surveillance and an annual description of ground water and surface water quality conditions in the East Poplar River Basin near the International Border and to provide support to a Bilateral Monitoring Committee.

RATIONALE A Bilateral Monitoring Arrangement has been signed by Canada, Saskatchewan, Montana and the U.S.A. Under the terms of the arrangement, Environment Canada is committed to monthly sampling of the East Poplar River, reporting of surface water data, raising and resolving concerns, preparing reports, and reviewing groundwater data. This is done in order to monitor the possible effects on the surface water and ground water regimes of the Saskatchewan Power Corporation mine and generating plant operation near the International Border on the East Poplar River.

DESCRIPTION Under the terms of the Poplar River Bilateral Monitoring Arrangement, the Branch is committed to: monitoring water quality, maintaining a data base and, upholding other obligations under the Bilateral Agreement.

Refer to Project 304 for Sampling Matrix and Analytical Requirements for Station No. 7, East Poplar River at International Boundary.

COORDINATOR(S) - Gummer, Crosley,

RESOURCES

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.25		0.25
	PY Tech					
	Salary			10.6		10.6
	O & M					
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.25		0.25
Total Dollars				10.6		10.6

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
318-87 Northern Manitoba Flood Agreement

SUBMITTER - 0417
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES To conduct bimonthly surveys at selected sites during the open water period and three collections during the ice covered period in the Northern Flood Agreement Study Area. To determine the seasonal variability of the physical-chemical-biological parameters in the study area.

RATIONALE This investigative survey is designed to address Clause 17.1 of the Northern Flood Agreement as it pertains to implementing Recommendation 10 of the Lake Winnipeg, Churchill and Nelson Rivers Study Board. Recommendation 10 calls for a long-term coordinated ecological monitoring and research program to allow impact evaluation and to assist in the ongoing management of the affected area.

DESCRIPTION The long term ecological monitoring program extends five years. The proposal for 1987 (year two) is to characterize the existing water quality. This information is necessary for a management plan for the affected area and the identification of adverse effects on the traditional water uses as a result of the Churchill/Nelson Rivers diversion and associated developments. Bimonthly sampling in open water and three collections under ice conditions will be completed. Parameters include nutrients, physicals, major ions, synthetic organic compounds, biological components, metals, and trace elements. Water and suspended sediment will be collected from a number of sites from four river systems located in the Northern Flood Area.

COORDINATOR(S) - P. Seidl, K. Thomson, R. Hale

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			1.0	0.1	1.1
	PY Tech			0.7		0.7
	Salary			65.3	4.3	69.6
	O & M					
	Capital					
Recov.	PY Prof					
	PY Tech		0.53			0.53
	Salary		17.2			17.2
	O & M		8.6	110.4		119.0
	Capital		2.4	10.0		12.4
	Total	47.8				
PY Total			0.53	1.7	0.1	2.03
Total Dollars		47.8	28.2	185.9	4.3	266.2

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
318-87 Northern Manitoba Flood Agreement

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
	Little Playgreen Lake, East Channel	00MA05UB0022	V
	Little Playgreen Lake, West Channel	00MA05UB0024	V
	Ross Island Ferry Crossing - Upper Nelson River	00MA05UB0026	V
	Upper Nelson River at Inlet to Pipestone Lake	00MA05UB0028	V
	Tailrace of Jenpeg Dam Inlet to Cross Lake	00MA05UD0005	V
	Upper Nelson River at outlet of Cross lake- Bladder Rapids	00MA05UD0006	V
	Rat River at inlet to Threepoint Lake	00MA05TF0001	V
	Rat River at Outlet of Threepoint Lake	00MA05TF0004	V
	Burntwood River at Inlet to Split Lake	00MA05TC0004	V
	Tailrace of Kelsey Dam- Split Lake	00MA05UF0010	V
	Lower Nelson River at Outlet of Split Lake	00MA05UF0003	V
	Lower Nelson River at Outlet of Stephens Lake- Kettle Rapids Dam Tailrace	00MA05UF0012	V
	Aiken river Inlet to Split Lake	00MA05UF0011	V
	Upstream of Thompson Bridge Crossing - Burntwood River	00MA05TG0000	V

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
318-87 Northern Manitoba Flood Agreement

SAMPLING MATRIX

Schema	LAB	Parms	7 Stns	2 Stns	5 Stns	Total
SA1	F	Phys(F)	V	V	V	208
SB3	S	Chlor(F)	V	V	V	208
SC1	B	MajorIon	V	V	V	208
SC2	S	Phys(L)	V	V	V	208
SC4	S	NFR-NFFR	V	V	V	208
SD2	S	Nutrients	V	V	V	208
SD3	S	P Ortho	V	V	V	208
SD4	S	DIC	V	V	V	208
SD5	S	NH3	V	V	V	208
SE1	B	T Metals	V	V	V	208
SE2	B	Fe-Mn(Diss)	V	V	V	208
SE3	B	Fe-Mn(Ext)	V	V	V	208
SE4	B	Al(Ext)	V	V	V	208
SE5	B	Al(Diss)	V	V	V	208
SE7	B	Hg(T)	V	V	V	208
SE10	W	Methyl-Hg			V	26
SF1	B	As-Se(F)	V	V	V	208
SH2	B	Herbs(New)			V	21
SH5	B	OC-PCB			V	21
SH8	S	Phenol			V	21
SEDIMENT SAMPLES						
RE1	B	T Metals			V	15
RE2	B	Hg(T)			V	15
RE3	W	Methyl-Hg			V	15
RF1	B	As-Se(T)			V	15
RH1	B	OC-PCB			V	15
BIOLOGICAL SAMPLES						
TE1	W	T Metals			V	15
TE3	W	Hg(T)			V	15
TE4	W	Methyl-Hg			V	15
TF1	W	As-Se(T)			V	15
TH1	W	OC-PCB			V	15
TJ1	W	Lipid			V	15

Note: Intensive bacterial sampling is also to be conducted at five Northern Flood Communities.

W - Place of analysis represent DFO in Winnipeg under contract.

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
319-87 South Saskatchewan River Basin Study

SUBMITTER - 0003
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION -

OBJECTIVES To develop water quality objectives to aid in a water resources management strategy for the South Saskatchewan River Basin.

RATIONALE There are concerns that the South Saskatchewan River system will not be able to support the range of current and future uses. The water quality studies form a part of a planning study to address short and long term water quality issues in the basin.

DESCRIPTION Work is being undertaken in close cooperation with Saskatchewan Department of Environment. Basin water quality issues and problems are being identified, previous studies researched and collected, data assembled and summarized, data gaps identified and water quality objective methologies appropriate to the basin are being evaluated. Field work will fill data gaps and attempt to characterize effects of water quality on basin biota. This is the first year of a three year study.

COORDINATOR(S) - Blachford

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.6		0.6
	PY Tech			0.07		0.07
	Salary			27.8		27.8
	O & M			30.0		30.0
	Capital					
Recov.	PY Prof					
	PY Tech		0.03			0.03
	Salary		0.9			0.9
	O & M	18.9	0.4			19.3
	Capital		0.1			0.1
PY Total			0.03	0.67		0.7
Total Dollars		18.9	1.4	57.8		78.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
319-87 South Saskatchewan River Basin Study

INDICATORS - 1.1 C-1-a,b
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS
1 Project Coordinator(s)
2 WESTORE
3 NAQUADAT

ACTIVITIES/REPORTING CALENDAR
N/A

STATION LIST

Stations have not been identified at time of writing.

SAMPLING MATRIX

Schema	LAB	Parms	Total
SA1	F	Phys(F)	10
SB3	S	Chlor(F)	10
SC1	B	Majorion	10
SC4	S	NFR-NFFR	10
SD1	S	Nutrients	10
SE1	B	T Metals	10
SE2	B	Fe-Mn(Diss)	10
SE6	B	Cr(T)	10
SE7	B	Hg(T)	10
SF1	B	As-Se(F)	10
SF2	S	B(F)	10
SG1	S	Cn	10
SH2	B	Herbs(New)	10
SH4	B	Herbs(Neut)	10
SH5	B	OC-PCB	10
SH8	S	Phenol	10
SEDIMENT SAMPLES			
RE1	B	T Metals	5
RE2	B	Hg(T)	5
RF1	B	As-Se(T)	5
RH1	B	OC-PCB	5
BIOLOGICAL SAMPLES			
TE1	B	T Metals	10
TE3	B	Hg(T)	10
TF1	B	As-Se(T)	10
TH1	B	OC-PCB	10

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
321-87 Analytical Support - Saskatchewan Environment

SUBMITTER - 0428
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES To provide analytical support on a full cost recovery basis to Saskatchewan Department of Environment in their program for monitoring and studying toxic substances.

RATIONALE The WQB (federal government) is committed to federal-provincial cooperation in water resources management programs.

DESCRIPTION The Branch has a long history of supporting the work of the Government of Saskatchewan. The withdrawal of the Branch from interprovincial monitoring has left a gap which Saskatchewan has attempted to fill. Saskatchewan has limited capability for analyzing for toxic substances, particularly organics. Because of the precedence and because of the federal interest in toxic substances, the Branch has agreed to support the toxic substances program of Saskatchewan by carrying out analysis on a full cost recovery basis. Costs are recovered in accordance with the National Laboratory Cost Schedule and are estimated to be about $20,000 in FY 86/87. An agreement with complete details is on file.

COORDINATOR(S) - J.G. Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.01			0.01
	PY Tech					
	Salary		0.4			0.4
	O & M					
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
	Total	15.0				15.0
PY Total			0.01			0.01
Total Dollars		15.0	0.4			15.4

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
322-87 Analytical Support - Miscellaneous

SUBMITTER - 0459
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES To provide field and analytical support to pollution surveys as the urgency may require.

RATIONALE Not all analytical requirements are known in advance. Sampling is sometimes initiated following spills and other pollution events which require laboratory support.

DESCRIPTION When sampling of pollution events occurs or when unplanned sampling in support of other budgeted projects is conducted, e.g. follow-up pollution verification surveys, the laboratory is contacted regarding its perceived involvement. Work load, sample type, parameter selection, sample turnaround time and reporting requirements are generally determined in advance of the sample analysis.

COORDINATOR(S) - J.G. Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.01	0.01		0.02
	PY Tech		0.02	0.02		0.04
	Salary		0.7	0.7		1.4
	O & M		1.2	1.1		2.3
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.03	0.03		0.06
Total Dollars			1.9	1.8		3.7

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
323-87 Analytical Support - Other Federal Agencies

SUBMITTER - 0459
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES To provide field and analytical support to ongoing programs and pollution surveys by other federal agencies as may be required.

RATIONALE Not all analytical requirements are known in advance. Sampling is sometimes initiated following spills and other pollution events which may require laboratory support. It is Branch policy to provide analytical support to federal agencies but within the restraints of staff and dollars. When necessary, OM costs and salary are recovered.

DESCRIPTION When sampling of pollution events occurs or when unplanned sampling by other federal agencies is conducted (e.g. follow-up pollution verification surveys) the laboratory may be asked to provide analytical support. Work load, sample type, parameter selection, sample turnaround time and reporting requirements are generally determined in advance of the sample analysis. Support is also provided to ongoing activities of the federal agencies (CWS, NHRI, NWRI) to assist them in meeting their analytical needs. There is more information regarding support for CWS and NWRI on file.

COORDINATOR(S) - J.G. Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.01	0.01		0.02
	PY Tech		0.02			0.02
	Salary		0.7	0.4		1.1
	O & M			12.2		12.2
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.03	0.01		0.04
Total Dollars			0.7	12.6		13.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
330-87 Regional Quality Control Assurance Program

SUBMITTER - 0003
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing since 1984

OBJECTIVES To continue to evaluate programs, activities and methods in a systematic fashion to enhance the quality of the information provided by the WQB.

RATIONALE In order to fulfill its mandate, the Branch is committed to producing the best possible data and to fully understanding the limits of this data.

DESCRIPTION In order to meet their commitment to quality control, the Branch operates several projects. These quality control projects focus on both the field and laboratory stages of data production and are outlined for specific activities in subsequent projects. The Branch, however, recognizes the need for continued dialogue within as well as with experts from outside the Branch and the synthesis of this information in the development of a regional quality assurance program. The quality assurance program is perceived to be evolutionary with the goal in FY 87/88 being to outline the essential elements of a regional quality assurance plan and implement or modify specific aspects of its monitoring and special study activities identified as requiring immediate attention. Emphasis initially will be on inorganic parameters and nutrients followed in subsequent years by toxic organic substances.

COORDINATOR(S) - Chu

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.15		0.15
	PY Tech			0.1		0.1
	Salary			9.6		9.6
	O & M			2.0		2.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.25		0.25
Total Dollars				11.6		11.6

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
331-87 Field Quality Control

SUBMITTER - 0446
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - Ongoing since 1980

OBJECTIVES
(1) Ascribe a degree of precision to the existing sampling method for specific parameters.
(2) Establish criteria on which to review the project design.
(3) Periodically review the project design.
(4) Prepare interpretive reports on an as required basis.

RATIONALE Knowledge of sampling precision is invaluable to data interpretation. In order that the field quality control project be carried out in the most effective manner possible, a routine procedure for the analysis of data and review of the project design is required.

DESCRIPTION This project is intended to help ensure consistency in field practices and to quantify the precision of sampling practices. In order to carry this out, replicate samples are collected and analyzed. The results are used to determine analytical variability, calibrate instruments and ensure overall quality control.

COORDINATOR(S) - Chu, Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.06	0.20		0.15
	PY Tech		0.15	0.03		0.23
	Salary		7.4	9.5		13.8
	O & M		3.2			3.2
	Capital		0.9			0.9
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.18	0.23		0.41
Total Dollars		33.0	11.5	9.5		54.0

* Affiliated C&P Program(s) - 1.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
332-87 Miscellaneous Field Quality Control

SUBMITTER - 0447
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES Project allows coding of data not intended to be entered on NAQUADAT.

RATIONALE Some data generated in certain projects is not wanted on NAQUADAT. As a result, a special project number is required to allow coding for in-house data analysis and to make NAQUADAT entry more streamlined.

DESCRIPTION This is an "umbrella" project intended to allow coding of miscellaneous samples from various projects, which are not to be stored on NAQUADAT (i.e. distilled water blanks, sample to assess field filtering methods, etc.). Annual reports to file based on the results from the filter blank and rinse water blank samples are required from each of the Resource Officers for samples generated in their programs.

COORDINATOR(S) - B. Chu

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof					
	PY Tech		0.03			0.03
	Salary		0.9			0.9
	O & M		0.4			0.4
	Capital		0.2			0.2
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.02			0.03
Total Dollars		0.2	1.5			1.7

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
333-87 Inter-Regional Quality Control

SUBMITTER - 0444
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES To ensure the quality and compatibility of laboratory data by participating in the national round-robin quality control programs.

RATIONALE Quality assurance or quality control ensures that the integrity of the data generated at the laboratory is maintained at a high level of excellence.

DESCRIPTION The respective National Coordinators for the IRQC/PPWB and LRTAP round robin quality control programs select parameters for investigation and submits appropriate samples to participating laboratories of which the Saskatoon Branch Laboratory is one. A high priority is given to analyzing these samples.

The accuracy and precision of the data generated by the Saskatoon Laboratory is compared by the project coordinators to the known values and to the results from other laboratories. If the examination shows it to be necessary, methodology is changed to improve the quality of the generated data.

COORDINATOR(S) - Zakrevsky, Lee, Chu

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.04			0.04
	PY Tech		0.20			0.20
	Salary		8.2			8.2
	O & M		0.50			0.50
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.24			0.24
Total Dollars			8.7			8.7

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
334-87 Intra-Laboratory Quality Control

SUBMITTER - 0448
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES To ensure the quality and compatibility of laboratory data by checking analytical performance of the Inorganic Laboratory through the use of replicates, spikes, blanks, blind unknowns and parameter correlations.

RATIONALE An adequate Intra-Laboratory QC Program provides a mechanism whereby analytical results are continuously monitored for precision and accuracy and corrective action is immediately taken if results are found to be outside of pre-established control limits.

DESCRIPTION Replicate checks must be carried out, during each analytical run, on natural samples or standard solutions containing the parameter of interest. The analytical results from these replicates allow the construction of QC Charts. Similarly, results from spiking experiments can be plotted to monitor recoveries.

COORDINATOR(S) - Zakrevsky, Lee, Chu

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Totals
A Base	PY Prof		1.15	0.01	0.81
	PY Tech		0.65		1.00
	Salary		70.0	0.4	70.4
	O & M		0.5		0.5
	Capital				
Recov.	PY Prof				
	PY Tech				
	Salary				
	O & M				
	Capital				
PY Total			1.8	0.01	1.81
Total Dollars			70.5	0.4	70.9

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
335-87 METHOD EVALUATION STUDIES

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - 1987/88

OBJECTIVES

1. Evaluate "weak" methods in order to determine deficiencies and find ways of improving performance.
2. Evaluate alternative procedures or methods of analysis which offer better potential, in terms of quality and/or efficiency, than the existing methodology.
3. Identify, evaluate and implement analytical methodology in order to respond to new program needs (e.g. new parameter, new detection limit, etc.).

RATIONALE

Many of the methods presently in use in our laboratory have never been thoroughly evaluated. Although most are adapted from existing "standard" methodology, there is a need to better define operating parameters and to quantitatively determine the limitations of each method since each setup may not be identical to the original one.

Existing methods are often superseded by new technology or approach. In order to maintain the highest possible level of performance, both efficiency and quality, it is necessary to examine the literature, on a continuous basis, for promising alternatives and to evaluate procedures which show a clear potential for upgrading performance.

New analytical needs may arise as new monitoring projects are created or existing ones are modified and therefore the evaluation and implementation of new laboratory methodology will be necessary.

DESCRIPTION

Method evaluation for boron, sulfide, chlorophyll-a, phenolics, and free cyanide will be conducted. See the extended description for more detail.

COORDINATOR(S) - Jean-Guy Zakrevsky, Guat Peng Lee

RESOURCES ($ 000.)

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof		0.60			0.60
PY Tech		0.65	0.01		0.66
Salary		46.6	0.3		46.9
O & M		9.0			9.0
Capital		20.0			20.0
PY Total		1.25	0.01		1.26
Total Dollars		74.6	0.3		74.9

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
340-87 International Water Quality Objectives

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES Initiate and implement negotiations with pertinent officials, with respect to the establishment of water quality objectives at specific transboundary locations.

RATIONALE Within Western and Northern Region, there is a significant amount of transboundary drainage. For those streams which cross international or territorial borders, the federal government has a clear responsibility to promote the establishment of water quality objectives.

DESCRIPTION

During the year 1987/88, discussions will continue between U.S.A. and Canadian agencies on the establishment of objectives for the Souris River at both transboundary locations.

COORDINATOR(S) - Thomson, Blachford

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.85		0.85
	PY Tech					
	Salary			36.1		36.1
	O & M			7.5		7.5
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.85		0.85
Total Dollars				42.6		42.6

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
341-87 Interprovincial and Federal WQO Promotion and Development

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES Provide ongoing assistance and advice upon request to WQB-W&NR staff and to promote and assist in the application of water quality objectives for interprovincial waters; and promote and develop water quality management strategies for federal waters.

RATIONALE Other divisions of WQB, W&NR, other federal agencies as well as provincial governments are involved in activities that may either support or benefit from the support of the Water Quality Objectives Division. Input to these activities is required on a continuing basis from WQO Division in order that maximum, mutual benefit is achieved.

DESCRIPTION Support and advice, with respect to water quality objectives, will be given to the Branch representative on the PPWB Committee on Water Quality, Branch staff and, where feasible, to individual provinces. Contact will be developed and maintained with other federal agencies with regard to the promotion of water quality objectives.

COORDINATOR(S) - Thomson

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.4		0.4
	PY Tech					
	Salary			17.0		17.0
	O & M			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.4		0.4
Total Dollars				22.0		22.0

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
342-87 Water Quality Objectives Evaluation

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES To review and revise, where necessary, the existing Regional plan for the Water Quality Objectives Division; to maintain knowledge of policy and technical advances; develop and review surveillance monitoring strategies and resultant data for relevant locations.

RATIONALE In order to maintain orderly and logical operation of the Water Quality Objectives Division as well as contribute to the Long Term Operational Planning process, the Division regional plan must be kept current. One method of doing this is through maintenance of a continual awareness of advances in related technology and policy. This allows an evaluation of current procedures and appropriate revisions. Compliance monitoring is also a form of water quality objectives evaluation. Not only does it serve to evaluate the quality of water it also points out shortfalls in technologic or strategic design, where appropriate revisions should be made.

DESCRIPTION Based on the findings of meetings with WQB and other government agencies, and a review of relevant literature, the operational plan will be updated. Transboundary streams will be ranked according to their need for objectives.

COORDINATOR(S) - Thomson

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.65		0.65
	PY Tech					
	Salary			27.6		27.6
	O & M			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.65		0.65
Total Dollars				32.6		32.6

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
343-87 Monitoring and Objectives Evaluation

SUBMITTER - 0003
C&P PROGRAM - 1.1-Interjurisdictional Water Management
DURATION - 1987-88

OBJECTIVES To test and refine monitoring techniques in order to assess their adequacy when utilized in the development and maintenance of water quality objectives.

RATIONALE Routine water quality data obtained at sites for which water quality objectives are being considered may be inadequate for that purpose. Water quality constituents may be present which have not previously been detected or have been detected in a manner which does not adequately characterize water quality conditions at that site. The converse may also be true. Therefore reconnaisance monitoring must be taken as part of a station validation exercise. The results of this type of investigation can then be used in the formulation of valid objectives for a particular site. It will also contribute to the development of a suitable surveillance monitoring strategy.

DESCRIPTION Reconnaisance surveys will be undertaken at five sites where water quality objectives are being considered. For the Souris River emphasis will be placed on evaluation of dissolved oxygen as an indicator parameter for water quality objectives. Major emphasis at the other sites will be on non-target organic scans, to ascertain the validity of the existing data for those sites. Follow-up surveys at these and additional sites is anticipated in future years.

COORDINATOR(S) - Blachford ,Thomson

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.35		0.35
	PY Tech		0.05	0.05		0.10
	Salary		1.8	16.4		18.2
	O & M		0.9	5.0		5.9
	Capital		0.2			2.0
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.05	0.40		0.45
Total Dollars		7.3	2.9	21.4		31.6

* Affiliated C&P Program(s) - 1.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
343-87 Monitoring and Objectives Evaluation

SAMPLING MATRIX

Schema	LAB	Parms	5 Stns	Total
SA2	F	Phys(F)		10
SB1	F	Coliform		50
SC1	B	Majorion		10
SC2	S	Phys(L)		10
SC3	S	NFR		30
SD2	S	Nutrients		30
SE1	B	T Metals		10
SE2	B	Fe-Mn(Dis)		10
SE6	B	Cr(T)		10
SE7	B	Hg(T)		10
SF1	B	As-Se(L)		10
SF2	S	B(L)		10
SH2	B	Herbs(new)		3
SH4	B	Herbs(neut)		3
SH5	B	OC-PCB		3
SH8	S	Phenol		10
TE1	B	T Metals (bio)		5
TE3	B	Hg(T) (bio)		5
TF1	B	As-Se(T) (bio)		5
TH1	B	OC-PCB (bio)		5
TJ1	B	Lipid		10

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
6	Waterton River at Hwy. 6	00AL05AD0005	V
5	Belly River at Hwy. 6	00AL05AD0060	V
	Unspecified sites in Waterton Park		V

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
351-87 Intensive Nutrient Monitoring of Lake Diefenbaker

SUBMITTER - 0007
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Since 1984

OBJECTIVES To quantify macro-nutrient loadings to and from Lake Diefenbaker.

RATIONALE It is important to quantify nutrient loadings into and out of Lake Diefenbaker in order to assess trophic state and the need for remedial measures. Current monthly sampling upstream is inadequate for this purpose as is in-lake sampling. Therefore intensive weekly monitoring has been undertaken such that input-output loadings can be determined.

DESCRIPTION

A weekly sample is collected by a lay collector at Lemsford Ferry and shipped directly to the regional lab in Saskatoon. Output is sampled at Gardner Dam by SPC personnel on a weekly basis. Quality control samples are also collected here. Weekly sampling is likely adequate although more frequent sampling may be required during high flow periods. Sampling commenced in October 1984 and should continue for at least three years.

COORDINATOR(S) - Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.08	0.02		0.10
	PY Tech		0.18	0.03		0.21
	Salary		9.3	1.8		11.1
	O & M		4.2	2.0		6.2
	Capital		1.1			1.1
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.26	0.05		0.31
Total Dollars			14.6	3.8		18.4

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
351-87 Intensive Nutrient Monitoring of Lake Diefenbaker

INDICATORS - N/A
PRIORITY - 8 weeks

DISSEMINATION OF LABORATORY DATA REPORTS
Project Coordinator

ACTIVITIES/REPORTING CALENDAR
N/A

STATION LIST

No.	Station location	NAQUADAT no.	Sampling frequency
1	S. Saskatchewan River at Lemsford Ferry	00SA05HB0001	V
2	L. Diefenbaker at Gardiner Dam	no number	V

SAMPLING MATRIX

Schema	LAB	Parms	Stns 1,2	Total
SC2	S	Phys(L)	W	120
SC3	S	NFR	W	120
SD2	S	Nutrients	W	120
SD3	S	P Ortho	W	120
SD6	S	DN,PN	W	120

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Cost per Schema	Proj 351 samples	Proj 351 Cost
SC2	S	Phys(L)	12.01	120	1441.2
SC3	S	NFR	9.12	120	1094.4
SD2	S	Nutrients	68.26	120	8191.2
SD6	S	DN,DP	18.24	120	2188.8
SD7	S	P Ortho(L)	5.31	120	637.2
TOTAL	S			600	13552.8
G TOTAL				600	13552.8

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
360-87 Regional Biological Monitoring Program

SUBMITTER - 0489
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing

OBJECTIVES To develop and initiate a biological monitoring program to assist in assessing aquatic quality within the Western and Northern Region.

RATIONALE An adequate assessment of aquatic quality is an integrated approach of the chemical, physical and biological sciences. The Branch has undertaken the development of a biological monitoring program to meet this need.

DESCRIPTION A biological monitoring program is being developed through a search of the scientific literature, contacting and meeting experts in the field, reviewing present WQB biological activities and undertaking pilot studies.

COORDINATOR(S) - Munro

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.30		0.30
	PY Tech					
	Salary			12.7		12.7
	O & M			8.0		8.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.30		0.30
Total Dollars				20.7		20.7

* Affiliated C&P Program(s) - 1.1, 1.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
361-87 Forage Fish Assessment Program

SUBMITTER - 0489
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing - with annual rotation of sampling sites

OBJECTIVES To collect forage fish samples at various monitoring locations throughout the Region to examine metal and organic compounds in their tissues. Update report with results from 1986/87 sampling program.

RATIONALE In order to adequately assess the aquatic quality the Branch feels an integrated approach to monitoring is required which examines chemical, physical and biological sciences and multiple media analysis. This project is intented to expand on the media analyzed by the Branch to include biological organisms at selected sites.

DESCRIPTION

The WQB decided in September 1983 to initate a forage fish program to assess the bioaccumulation of pollutants in the aquatic environment. In this Region forage fish have been collected since 1984 and analyzed for a number of metals and organic substances. To date samples have been collected from 18 routine monitoring sites. In 1987/88 samples will be collected from 3 additional sites and from 5 sites that were sampled in 1984. The data report based on the 1984 and 1985 samples will be updated to include the results from the 1986 samples. In addition forage fish sampling has also been incorperated in the Manitoba Enhanced Monitoring Program (371-88).

COORDINATOR(S) - D. Munro

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	TOTALS
A Base	PY Prof			0.25		0.25
	PY Tech			0.05		0.05
	Salary			12.2		12.2
	O & M			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.30		0.30
Total Dollars		12.2		17.2		29.4

* Affiliated C&P Program(s) - 1.1, 1.3.

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
361-87 Forage Fish Assessment Program

SAMPLING MATRIX

Schema	LAB	Parms	All 8 Sites	Total
TE1	B	T Metals	V	20
TE3	B	Hg(T)	V	20
TF1	B	As-Se(T)	V	20
TH1	B	OC-PCB	V	15
TJ1	B	Lipid	V	35

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
1	Milk River at East Crossing of Int'l Boundary	00AL11AA0003	V
2	Milk River at West Crossing of Int'l Boundary	00AL11AA0002	V
3	North Milk River at Int'l Boundary	00AL11AA0001	V
22	South Saskatchewan River at Highway 41	00AL05AK0001	V
23	Red Deer River At Bindloss	00AL05CK0001	V
24	Beaver River at Beaver Crossing	00AL06AD0001	V
94	North Saskatchewan River at Lea Park	00AL05EF0001	V
28	Battle River near Unwin	00SA05FE0001	V

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
370-87 Evaluation of Toxic Chemicals Program

SUBMITTER - N/A
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - Ongoing

OBJECTIVES To complete a discussion paper which evaluates the present toxic chemicals program and its ability to identify and assess the distribution of toxic chemicals in waters of federal interest and make suggestions for possible change in the program.

RATIONALE Information on the presence, abundance, distribution, mobility and effects of toxic chemicals is essential towards understanding the risk these chemicals pose to man and the environment. The Branch has monitored for toxic chemicals in water for many years and it is felt that although this monitoring is useful that it could be improved. To that end a discussion paper is to be prepared.

DESCRIPTION The Water Quality Branch monitoring for toxic chemicals in water has shown that toxic chemicals are not generally found, this has been accepted as an indication that toxic chemicals are not in the aquatic ecosystem. However, recently this assumption has been questioned and its has been suggested that other forms of monitoring might show that toxics are presence. The Branch has conducted numerous pilot studies in recent years to try to assess the potential use of other monitoring techniques for assessing the presence of toxic chemicals in the aquatic ecosystem. A draft discussion paper has been prepared which examines the present monitoring program with suggestion for possible improvement. The discussion paper will be finalized and consideration given to modifying the program.

COORDINATOR(S) - D. Munro, H. Vaughan

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.30		0.30
	PY Tech					
	Salary			12.7		12.7
	O & M			8.0		8.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.30		0.30
Total Dollars				20.7		20.7

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
371-87 Enhancement of Water Quality Monitoring

SUBMITTER - 0001
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - 1986 through 1989

OBJECTIVES
1. To initiate a pilot program for enhanced monitoring and assessment of toxic compounds.
2. To complement existing commitments and activities for PPWB, IJC, CCREM, Manitoba Drinking Water Proposal, NWRI, and the WQB objectives.
3. To generate information that can be used to support objectives; e.g., future studies on the assessment of system health over a definable range of conditions.

RATIONALE The routine monitoring program of WQB mostly consists of analysis of water samples, for a variety of chemical and biological constituents. Since sediments, fish and macrophytes are known to concentrate many toxic chemicals, analysis of these substrates may be more effective in detecting their presence, and in assessing the health of the aquatic environment. The project will be carried out at routine water quality monitoring sites. Routine monitoring data will be used in the interpretation of the study results.

DESCRIPTION Large volume water and suspended sediment samples will be collected in the spring and fall. Water samples will be extracted with an appropriate organic solvent. Bottom sediment, fish, and macrophytes will be collected in the fall. The samples will be analyzed for a variety of metals and organics at the National Laboratory in Burlington. Tests for toxicity screening will be conducted, for water extracts and sediments, at the University of Manitoba, and by NWRI in Burlington.

COORDINATOR(S) - Chacko
RESOURCES ($ 000.)

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof			0.35		0.35
PY Tech			0.30		0.30
Salary			24.6		24.6
O & M			5.0		5.0
Capital			*		
Contractual work:					
U of M			4.9		4.9
NWRI			4.9		4.9
Follow-up exploratory analyses			2.2		2.2
PY Total			0.65		0.65
Total Dollars	41.1		41.6		82.7

* Costs for suspended sediment sampler and in situ organic extractor are not included
Affiliated C&P Program(s) - 1.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
371-87 Enhancement of Water Quality Monitoring

SAMPLING MATRIX

Schema	LAB	Parms	Stn 12.15.31	Stn 14.16.30	Total
SE1	B	T Metals	V	V	8
SE2	B	Fe-Mn (D)	V	V	8
SE5	B	Al-diss	V	V	8
SE6	B	Cr (T)	V	V	8
SE7	B	Hg (T)	V	V	8
SF3	B	As-Se (L)	V	V	8
SH1	B	Herbs(Old)	V	V	8
SH2	B	Herbs(New)	V	V	8
SH4	B	Herbs(Neut)	V	V	8
SH5	B	OC/PCB	V	V	8
SH6	B	WOP1WOP2	V	V	8
RE1	B	Metal(sed)	V	V	18
RE2	B	Hg (T) (sed)	V	V	18
RF1	B	As-Se(T) (sed	V	V	18
RH1	B	OC/PCB(sed)	V	V	18
TE1	B	Metals (tiss)		V	10
TE3	B	Hg (tiss)		V	10
TF1	B	As-SE (tis)		V	10
TH1	B	OC/PCB		V	10
TJ1	B	Lipid		V	20
Organic scan water-sed			V	V	5
Organic scan macrophytes			V	V	5
Organic scan tissue			V	V	5

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
12	Souris River at Coulter	00MA05NF0009	see above
14	Pembina River at Windygates	00MA050B0001	see above
15	Red River at Emerson	00MA050C0001	see above
16	Roseau R. at Gardenton	00MA050D0001	see above
19	Pipestone Creek at Cromer	00MA05NG0013	see above
20	Winnipeg River near Pt. du Bois	00MA05PF0022	see above
30	Qu' Appelle River near Welby	00SA05JM0014	see above
31	Assiniboine R. at Kamsack	00SA05MD0002	see above
32	Saskatchewan R. above Carrot R.	00MA05KH0001	see above

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
372-87 Aquatic Quality Survey of the Northwest Territories

SUBMITTER - 0001
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing since 1985/86

OBJECTIVES To determine the fate, specifically the historical trend and current levels, and assess the significance to aquatic quality, of anthropogenic contamination of the Arctic and Sub-arctic aquatic environment, resulting from the long-range transport and subsequent depostion of aerosol contaminants.

RATIONALE Toxic substances have been detected in fish and seals in the Arctic, at levels high enough to cause concern. The source of these toxics is poorly understood. WQB wishes to establish the significance of atmospheric deposition to the surface waters, through an aquatic quality survey of selected waters.

DESCRIPTION This description is a summary only. More detailed information is available from the project coordinator. See also project 380-86 - Toxic Substance Survey of Snow in the Northwest Territories

The long range transport of pollutants, such as associated with the Arctic haze phenomenon, is believed to be contributing measurable quantities of xenobiotics to the aquatic environment on northern Canada. The health of these waters and the dependent biological community is likely to be degraded if these loadings continue. However, the overall sensitivity of these waters and indeed even the basic chemistry is an unknown. This research will "set the clock" with respect to the level of anthropogenic contanimants in the surface waters of the north by investigating the sediment record of selected lakes. This research will also determine aquatic quality of surface waters with respect to anthopogenically derived toxic metals and organic compounds as well as evaluating the importance of the atmospphere as a "source" though annual snow surveys and an ice cap survey.

The environmental significance of the measured contaminants levels will be assessed through the application of bioassessment techniques appropriate to the natural characteristics of this environment. Synthesis of this information will assist in determining the level and impact to date of deposition of toxic substances in the north, as well as providing significant direction for aquatic quality monitoring programs and research activities of environmental agencies.

COORDINATOR(S) - Gregor

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
372-87 Aquatic Quality Survey of the Northwest Territories

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.50		0.5
	PY Tech		0.01			0.01
	Salary		0.4	17.0		17.4
	O & M		0.2	54.4		54.6
	Capital			5.0		5.0
Recov.	PY Prof					
	PY Tech					
	Salary	(recovery is unknown at this time)				
	O & M					
	Capital					
PY Total				0.50		0.50
Total Dollars		30.4	0.6	76.4		107.4

* Affiliated C&P Program(s) - 4.2

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
372-87 Aquatic Quality Survey of the Northwest Territories

INDICATORS - N/A
PRIORITY - 12-weeks

DISSEMINATION OF LABORATORY DATA REPORTS - Project Coordinator

ACTIVITIES/REPORTING CALENDAR

See study outline above

STATION LIST
Stations are not defined as yet.

SAMPLING MATRIX

Schema	LAB	Parms	Total
SA3	F	Phys(F)	54
SC1	B	Majorion	54
SC2	S	Phys(L)	54
SE7	B	Hg(T)	54
Special Water Samples			
WCB	B	WCB- Chlorobenzenes	43
Misc.b	B	Toxaphene, PNA's, OC's, and PCB's (precip.)	43
Misc.c	B	Trace metals with 10-fold concentration by evaporation)	54

Note: Specifie stations have not yet been indentified.

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Cost per Schema	Proj 372 Samples	Proj 372 Cost
SA3	F	Phys(F)	0.00	54	
SC1	B	Majorion	52.57	54	2838.78
SC2	S	Phys(L)	12.01	54	648.54
SE7	B	Hg(T)	4.54	54	245.16
Misc.b	B	Toxaphene etc	432.00	43	18576.00
misc.c	B	ICAP Metals	15.90	54	858.60
WCB	B	Chlorobenzenes	183.60	43	7894.80
TOTAL	S			54	648.54
TOTAL	B			248	30413.34
G TOTAL				356	31061.88

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
373-87 Toxicity Profile of the Red River

SUBMITTER - 0003
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - 1987

OBJECTIVES

Incooperation with member agencies of the International Red River Pollution Board (IRRPB) conduct a toxicity profile of the Red River and it's tributaries from its source to Lake Winnipeg.

RATIONALE

The Red River has been sampled for various water quality parameters for many years. Recently, pesticides have been detected during spring runoff at low levels. The IRRPB and the Red River Objectives Task Force are concerned that such levels may have an adverse effect on the aquatic biota of the river and plan to assess this through a toxicity profile.

DESCRIPTION

A toxicity profile will be conducted in the spring of 1987 in the Red River Basin from its source to Lake Winnipeg by the member agencies of the IRRPB. The profile with be conducted using four toxicity tests on samples collected from 22 river sites and 15 effluent discharges in Minnesota, Norht Dakota and Manitoba. The profile will be conducted over a seven day period in April.

COORDINATOR(S) - Thomson

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.35		0.35
	PY Tech		0.01	0.10		0.11
	Salary		0.4	18.1		18.5
	O & M		0.2	5.0		5.2
	Capital					
PY Total			0.01	0.45		0.46
Total Dollars		16.2	0.6	23.2		39.9

Affiliated C&P Program(s) - 1.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
373-87 Toxicity Profile of the Red River

INDICATORS - 4.1 A-4-c, 1.3 A-1-c
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS - Project Coordinator

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1	April	Carry out field program
2	October	Complete report for IRRPB

STATION LIST

Sampling will be conducted at 37 site in total analytical support for nutrient and toxic chemical will however only be required from WQB for 10 river sites in Manitoba. Nutrients will be collected at ten sites for seven days. Toxics will will be collected at one site for seven days for immediate analysis samples for possible toxic chemical analysis will be collected at the other 9 sites and stored and analyzed only if a toxic response is found.

SAMPLING MATRIX

Schema	LAB	Parms	1 Stn	9 Stns	Other	Total
SC2	S	Phys (F)	V			20
SC3	S	NFR	V			20
SD2	S	Nutrients	V			20
SD3	S	P Ortho	V			20
SD5	S	Ammonia	V	V		70
SD6	S	DN,PN	V			20
SE1	B	T Metals	V		V	20
SE6	B	Cr (T)	V		V	20
SE7	B	Hg (T)	V		V	20
SF3	B	As-Se (L)	V		V	20
SH2	B	Herbs	V		V	20
SH4	B	Herbs	V		V	20
SH5	B	OC/PCB	V		V	20
SG1	S	Cyanide	V		V	20

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
374-87 Research Liaison and Technology Transfer

SUBMITTER - 0007
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - Ongoing

OBJECTIVES To enhance the activities and capabilities of the Branch and its personnel through liaison with IWD research agencies (NWRI and NHRI) as well as other agencies; and, to develop and/or adapt new technologies to the Branch measurement and assessment techniques.

RATIONALE The science of environmental quality measurement and assessment is rapidly evolving. Liaison with other water quality experts and researchers is mandatory if the Branch is to keep pace with this evolution. This will be achieved through cooperative efforts between the Branch and research scientists and other personnel for the purpose of exchanging ideas, expertise and developing or adapting new technology.

DESCRIPTION See also Projects 360,365,371,375, and 379.

1. Ongoing meetings with NWRI and NHRI staff in Burlington and Saskatoon regarding sampling and analysis of toxic substances;

2. Joint undertakings with GLFRB, DF&O to bioassess metals and other toxic substances in selected sediment samples;

3. Coordination with regional and national labs regarding data and methods;

4. Field testing and evaluation of a field liquid/liquid organic extraction system developed jointly by WQB and NWRI.

COORDINATOR(S) - Thomson, Vaughan, Munro

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.15		0.15
	PY Tech					
	Salary			6.4		6.4
	O & M			5.0		5.0
	Capital			1.0		1.0
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.15		0.15
Total Dollars				12.4		12.4

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
375-87 Specimen Banking

SUBMITTER - 0489
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - Ongoing

OBJECTIVES To establish and maintain a regional specimen bank for sediment, biological, and water samples. Establish procedures for collecting, treating, and storing sediments.

RATIONALE The establishment of a specimen bank will allow for the timely collection of samples from various field program , which can be stored for analysis at a latter date; thereby, reducing costs in the field and laboratory. In addition specimen banking could create a source of samples for possible retrospective analysis.

DESCRIPTION

This project will consist of keeping abreast of available information on the subject of sample storage including collection methods, splitting and preservation method and storage containers required for the various foreseeable analysis. Also included will be the maintenance of a procedure for recording and cataloguing of samples placed in the specimen bank. During FY 87/88, special studies will be undertaken to contribute samples to the bank as well as to provide time of collection analyses.

COORDINATOR(S) - Munro

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.05		0.05
	PY Tech					
	Salary			2.1		2.1
	O & M			2.0		2.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.05		0.05
Total Dollars				4.1		4.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
377-87 Toxic Chemicals Survey of Buffalo Pound Lake

SUBMITTER - 0001
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - 1987

OBJECTIVES

To examine the levels of toxic chemicals in the waters of Buffalo Pound Lake and within the Buffalo Pound Water Treatment Plan.

RATIONALE

GC scans of water samples from the Buffalo Pound Treatment Plant collected for a taste and odour study in 1984 and 1985 indicated the presence of numerous unidentified peaks. The significance of the peaks is unknown, however their presence is of concern in drinking water.

DESCRIPTION

Samples will be collected from Buffalo Pound Lake and at a number of stages in the water treatment plant to examples the presence of toxic chemicals in the water. Large volume (40 litre) samples will be collected and extracted in the field using the large volume flow through extractor developed by Goulden. Samples will be analyzed for OC/PCB and chlorobenzenes as well as mass spec analysis.

COORDINATOR(S) - Zakrevsky, Gummer and Brownlee (NWRI)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.05	0.15		0.20
	PY Tech			0.05		0.05
	Salary		2.1	6.4		8.5
	O & M		1.0	2.0		3.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.05	0.20		0.25
Total Dollars		4.4	3.1	8.4		15.9

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
377-87 Toxic Chemicals Survey of Buffalo Pound Lake

INDICATORS - $.1 B-1-c
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS - Project Coordinator

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1	June	Carry out field sampling
2	December	Complete report

STATION LIST
Stations are not defined as yet.

SAMPLING MATRIX

Schema	LAB	Parms	Total
SH5	B	OC/PCB	12
WCB	B	WCB- Chlorobenzenes	12

Note: Mass Spec work will be conducted through NWRI lab credits at the Netional Lab.

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Cost per Schema	Proj 377 Samples	Proj 377 Cost
SH5	B	OC-PCB	183.60	12	2203.2
WCB	B	Chlorobenzenes	183.60	12	2203.2
TOTAL	B			24	4406.4
G TOTAL				24	4406.4

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
379-87 LRTAP Monitoring and Special Studies

SUBMITTER - 0007
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing since 1984

OBJECTIVES To undertake, cooperate in, or advise on special surveys, monitoring programs and reporting of the measurement and assessment of surface water quality as affected by LRTAP and to provide advice to the Western LRTAP Committee as required.

RATIONALE LRTAP is a growing issue in Western Canada. WQB must be in a position to contribute to regional efforts directed at these concerns.

DESCRIPTION A number of specific and general activities are undertaken by the Branch in order to address regional LRTAP issues. These are undertaken under the Toxic Chemicals Program in order to cover both acid rain and toxic substances. The activities are as follows:

1. Assist NWRI in sampling for organic compounds in precipitation at selected sites within the region
2. Provide input to national and regional LRTAP committees
3. In cooperation with Saskatchewan Environment, undertake an intensive sampling program in the Cree Lake area in conjunction with the sampling undertaken in Project 312
4. Assist Province of Manitoba with analyses of water samples from acid sensitive lakes sampled by Manitoba Department of Energy, Mines and Resources.

It must be noted however, that items 3 and 4 above are subject to receiving funds from the IWD-LRTAP Program.

COORDINATOR(S) - Vaughan, Chu

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.10		0.10
	PY Tech			0.20		0.20
	Salary			10.8		10.8
	O & M			2.0		2.0
	Capital			2.0		2.0
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M			28.8		28.8
	Capital					
PY Total				0.30		0.30
Total Dollars		2.3		43.6		44.9

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
379-87 LRTAP Monitoring and Special Studies

INDICATORS - 4.1 A-2-a
PRIORITY - 16 weeks Turnaround

DISSEMINATION OF LABORATORY DATA REPORTS
Project Coordinator

ACTIVITIES/REPORTING CALENDAR
There will be six to nine lakes sampled about six times per year.

STATION LIST
Stations are not assigned as yet.

SAMPLING MATRIX

Schema	LAB	Parms	1 Stns	5 Stns	Total
SC1	B	Majorion		V	36
SE1	B	T Metals	V		9
SE3	B	Fe-Mn(Ext)	V		9
SE4	B	Al(Ext)	V		9
TOTAL	B				63

Note: most water chemistry for the Saskatchewan portion of the study will be analyzed the SRC in order to be comparable to SDOE data. However, triplicate samples will be submitted to WQB lab as per above matrix. Manitoba samples will be analyzed by a Manitoba laboratory, on a cost-shared basis.

SAMPLING MATRIX

Schema	LAB	Parms	Cost per Schema	Proj 379 Samples	Proj 379 Cost
SC1	B	Majorion	52.57	36	1892.52
SE1	B	T Metals	47.41	9	426.69
SE3	B	Fe-Mn(Ext)	2.28	9	20.52
SE4	B	Al(Ext)	1.14	9	10.26
TOTAL	B			63	2349.99
G TOTAL				63	2349.99

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
380-87 Toxic Substance Survey of Snow in the Northwest Territories

SUBMITTER - 0007
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing since 1985

OBJECTIVES (1) Collect large-volume snow samples from an estimated 20 sites widely distributed about the Keewatin and Franklin Districts, to provide a spatial pattern of snow chemistry. (2) Undertake snow pit sampling of approximately five-year aggregations to assess the temporal pattern of toxic chemical loadings over the last 50 years.

RATIONALE The transport of aerosol associated contaminants occurs dominantly during the winter, due to the southward movement of the polar front and the associated circulation patterns. A substantial proportion of the precipitation in the north comes as snow. The general range is 50 to 90% as snow for the eastern and high Arctic areas and as little as 30 % in the western NWT. For this reason, the eastern Arctic is to be emphasized in this study. Due to the atmospheric circulation patterns and the proportion of total precipitation falling as snow, it is reasonable to undertake a snow chemistry survey, to estimate the significance of this pathway to the loading of toxic substances to the northern aquatic environment.

DESCRIPTION The increasing weight of information on the presence of toxic substances in Arctic biota (e.g. seals and polar bears) warrants an assessment of pathways. This proposal is an effective means of collecting relevant information to provide a first approximation of the importance of atmospheric deposition to the toxic substance load to the northern aquatic system. The snow chemistry work outlined here is directly related to a toxic chemical study of fresh water aquatic systems (including water, sediment, and biota) in the central Keewatin. Preliminary work was initiated during the summer of 1985 and 1986 will continue in 1987 as part of a a WQB, WNR undertaking.

COORDINATOR(S) - Gregor
RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.50		0.5
	PY Tech		0.01			0.01
	Salary		0.4	17.0		17.4
	O & M		0.2	15.8		16.0
	Capital		0.1			0.1
PY Total			0.01	0.50		0.51
Total Dollars		23.1	0.7	32.8		56.6

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
380-87 Toxic Substance Survey of Snow in the Northwest Territories

SAMPLING MATRIX

Schema	LAB	Parms	Total
SA3	F	Phys(F)	55
SC1	B	Majorion	55
SC2	S	Phys(L)	55
SE7	B	Mercury	
SPECIAL ANALYSES (WATER)			
WCB	B	WCB-Chlorobenzenes	31
Misc.b	B	Toxaphene, PNA's,OC's, and PCB's (precip.)	31
Misc.c	B	Trace metals (with 10-fold concentration by evaporation)	55

NOTE: Specific stations are not yet identified.

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Cost per Schema	Proj 380 Samples	Proj 380 Costs
SA3	F	Phys(F)	0.00	55	
SC1	B	Majorion	52.57	55	2891.35
SC2	S	Phys(L)	12.01	55	660.55
SE7	B	Hg(T)	4.54	55	249.70
Misc.b	B	Toxaphene etc	432.00	31	13392.00
misc.c	B	ICAP Metals	15.90	55	874.50
WCB	B	Chlorobenzenes	183.60	31	5691.60
TOTAL	S			55	660.55
TOTAL	B			227	23099.15
G TOTAL				337	23759.70

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
3011-86 Red River Automonitor Data Review

SUBMITTER - 0003
ECS PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - 1984/85

OBJECTIVES To prepare a draft report on the historical automonitor data collectd from the Red River at Emerson Manitoba.

RATIONALE Under International Joint Commission (IJC) directives, the Water Quality Branch operates a continuous water quality monitor on the Red River at Emerson. Along with the continuous monitor data, monthly samples are collected. After 14 years, a large data base is available and the assessment of these data is a priority of the Branch.

DESCRIPTION Since 1971, the Branch has operated a continuous monitor at Emerson, Manitoba. Parameters measured are: DO, pH, conductivity, chlorides and temperature. With very few exceptions, the monitor has operated on a continuous basis; acquiring more than 95% of the intended data base. This data base is not only useful in evaluating IJC objectives but is valuable in assessing the water quality of the Red River during this period. Therefore, an evaluation and assessment of the data was prepared for March 31, 1986. After internal comment,a completed draft will be prepared for June 1 1986 with a final draft ready for external review scheduled for Oct 31 1986.

COORDINATOR(S) - V. Chacko
RESOURCES

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.30		0.30
	PY Tech					
	Salary			12.7		12.7
	O & M			4.0		4.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.30		0.30
Total Dollars				16.7		16.7

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
3012-87 Dauphin Basin Water Quality Assessment

SUBMITTER - 0003
ECS PROGRAM - 1.3 - Interjurisdictional Water Management
DURATION - 1987/88

OBJECTIVES
1. To compile and interpret the existing federal and provincial water quality data in the Dauphin Basin.
2. To investigate the potentil for pooling/merging the federal and provincial data in assessing the water quality of a basin.
3. To report a descriptiive water quality assessment of the Dauphin Basin in a federal-provincial publication.

RATIONALE During the last two decades all major streams and rivers of the Dauphin Basin have been sampled and analyzed either by a federal or provincial monitoring agency. These data have not been assessed to provide a descriptive presentation of the water quality in this basin. It is expected that the pooling of these data will provide a better base for interpretation. Recently the federal and provincial agencies have discontinued the monitoring in this basin and any future monitoring will be based on the evaluation of the existing data.

DESCRIPTION The federal and the provincial governments gathered water quality data from this basin employing different sampling and analytical methods. Despite such difference, it is believed that major ions and nutrient data can be pooled in assessing the water quality. However, for parameter groupings such as heavy metals, biocides such pooling may not be possible. A review of sampling and analytical methods will be carried out prior to pooling the data. It is hoped that this exercise will provide valuable insight in the pooling/merging of other federal and provincial water quality data.

COORDINATOR(S) - V. Chacko

RESOURCES

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.30		0.30
	PY Tech					
	Salary			12.7		12.7
	O & M (term)			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.30		0.30
Total Dollars				17.7		17.7

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
3015-87 Water Quality Data Reports

SUBMITTER - 0003
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES To publish detailed water quality data reports for Alberta, Saskatchewan, Manitoba and the Northwest Territories.

RATIONALE Data from Branch monitoring measurement and assessment programs should be made readily available to data users, including the public, the scientific community and other government agencies.

DESCRIPTION Data from monitoring, measurement and assessment programs are verified and stored on NAQUADAT. These data are published on an annual basis in provincial and territorial data reports.

COORDINATOR(S) - Block (Alta & NWT), Crosley (Sask), Chacko (Man)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.35		0.35
	PY Tech					
	Salary			14.8		14.8
	O & M			12.5		12.5
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.35		0.35
Total Dollars				37.3		37.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
3098-87 Electronic Data Processing Coordination

SUBMITTER - N/A
C&P PROGRAM - 1.3* - Water Quality Data Management
DURATION - Ongoing since 1980

OBJECTIVES To coordinate EDP activities in support of Branch operations and to ensure the orderly implementation and operation of EDP facilities.

RATIONALE The Western and Northern Region Water Quality Branch is expanding its use of electronic data processing to enhance its data management and interpretation capabilities. In order to coordinate these activities, and attempt to see that the Branch EDP resources are used effectively, this project has been established.

DESCRIPTION This project covers those electronic data processing (EDP) activities which are not project specific. The operation, maintenance, development and management of the Branch's EDP resources are overhead activities in that they benefit all projects which use EDP resources. The PY's shown in the Resources table include 1 term PY required to complete planned software development.

COORDINATOR - R.P. Schimnosky

RESOURCES ($ 000.)

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof			2.0		2.0
PY Tech					
Salary			84.5		84.5
O & M			130.0		130.0
Capital			40.0		40.0
PY Total			2.0		2.0
Total Dollars			254.5		254.5

* Affiliated C&P Program(s) - 1.1, 4.1

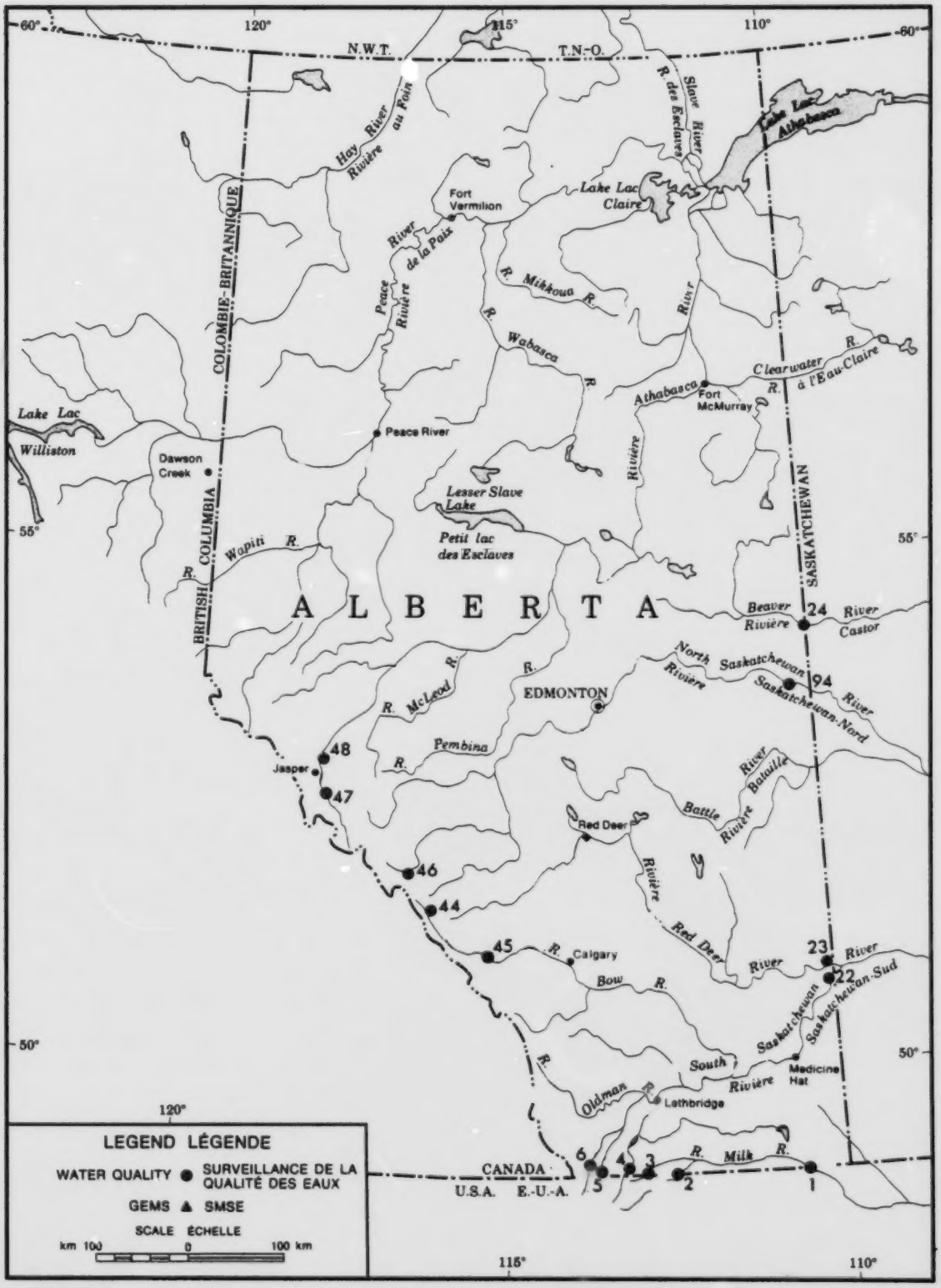


FIGURE 13 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

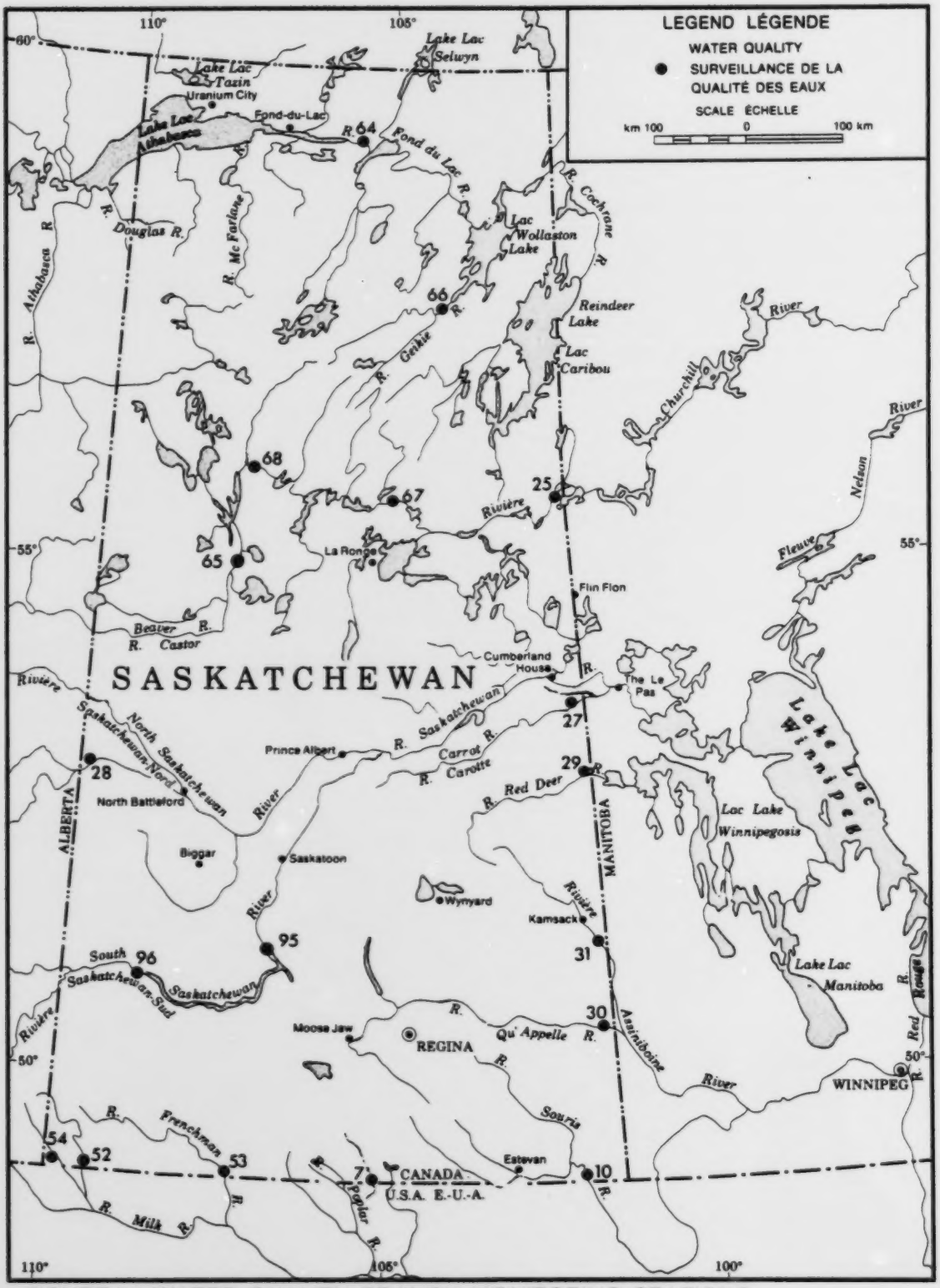


FIGURE 14 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

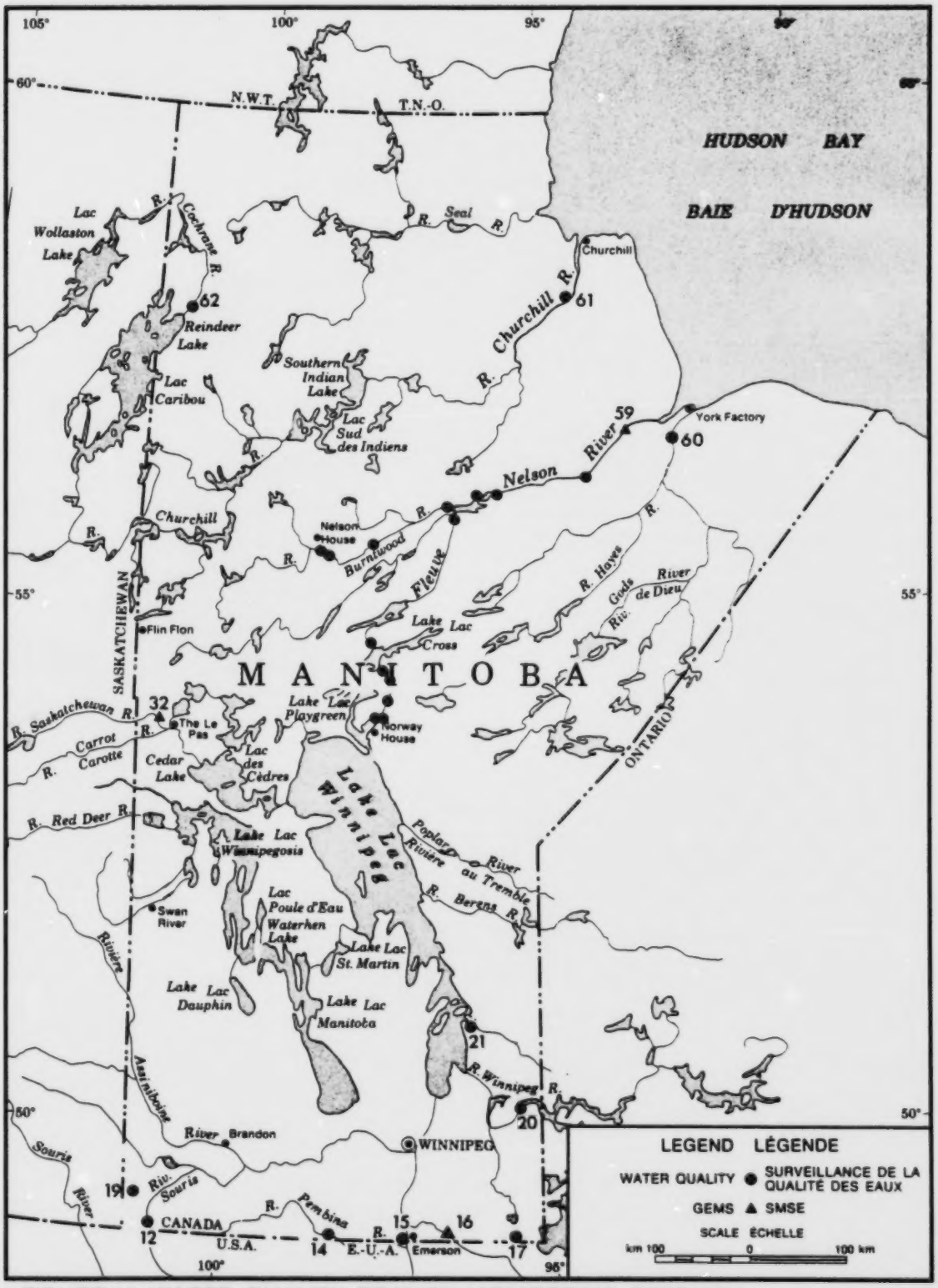


FIGURE 15 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

D.4.1 NORTHWEST TERRITORIES

Région du Nord-ouest

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
390-87 NWT Water Quality Monitoring Network

SUBMITTER - 0001
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - Ongoing since 1978

OBJECTIVES In cooperation with Water Resources Branch (WRB), to monitor the quality of surface waters at 17 existing locations and 19 tentative locations in the NWT, to prepare the regional ambient water quality data reports and the periodic reports on the quality of the aquatic environment.

RATIONALE Since the NWT are classified as Federal Lands the water quality at all 36 sites is considered to be of significant interest to Environment Canada and should be monitored. These data are required for regional reports on the quality of the aquatic environment.

DESCRIPTION A total of 36 sites will be monitored as stations of significant federal interest. The majority are co-located with the hydrometric sites and are sampled by WRB at time of visit.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.14	0.12		0.26
	PY Tech		0.25	0.05		0.30
	Salary		14.1	5.9		20.0
	O & M		6.3	85.0		91.3
	Capital		1.8			1.8
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.39	0.17		0.56
Total Dollars		26.2	22.2	90.9		139.3

* Affiliated C&P Program(s) - 1.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
390-87 NWT Water Quality Monitoring Network

INDICATORS - N/A
PRIORITY - Relative Rank 5. Sample Turnaround Time 16 weeks

DISSEMINATION OF LABORATORY DATA REPORTS
1 Project Coordinator(s)
2 WESTORE
3 NAQUADAT

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Update project description	December	
2 WRB undertakes fieldwork	ongoing	Time of visit sampling
3 Lab analysis	ongoing	Reports due 16 weeks from date of receipt at lab
4 Data verification	ongoing	Verify data within 10 days of receipt from lab
5 Review data and complete validation for data report	December	As per work plan

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
70	Mackenzie River near Fort Providence	00NW10FB0001	V
71	Camsell River at outlet of Clut Lake	00NW10JA0001	V
72	Coppermine River at outlet of Point Lake	00NW10PB0001	V
73	Tree River near the mouth	00NW10QA0001	V
74	Ellice River near the mouth	00NW10QD0001	V
75	Back River below Deep Rose Lake	00NW10RC0001	V
76	Great Bear River at outlet of Great Bear Lake	00NW10JC0001	V
77	Mackenzie River at Norman Wells	00NW10KA0001	V
78	Anderson River below Carnwath River	00NW10NC0001	V
79	Mackenzie River above Arctic Red River	00NW10LA0003	V
81	Quoich River above St Clair Falls	00NW06MB0001	V
82	Kazan River above Kazan Falls	00NW06LC0001	V
83	Baker Lake at Baker Lake	01NW06MA0001	V
84	Thelon River above Beverly Lake	00NW06JC0001	V
85	Lockhart River at outlet of Artillery Lake	00NW07RD0001	V
97	Cameron River below Reid Lake	00NW07SB0011	V

98	Yellowknife River Mouth Upstream of Yellowknife Bay	00NW07SB0001	V

Tentative New Northwest Territories Monitoring Stations

Map No.	Station Location	NAQUADAT Number	Sampling Frequency
	Kognack River below Mountain Lake		V
	Dubawnt River at outlet of Marjorie Lake		V
	Dubawnt R. above Dubawnt Lake		V
	Kazan River above Yathkyed Lake		V
	Hayes River above Chantry Lake		V
	Loillard River Above Daly Lake		V
	Snowdrift River at Outlet of Sitaza Lake		V
	Thoa River near Inlet to Hill Island Lake		V
	Mountain River Below Cambrian Lake		V
	Keele River above the mouth		V
	Mackenzie River at Fort Good Hope		V
	Mackenzie River above Napoiak Channel		V
	Johnny Hoe River above Lac Ste Therese		V
	Horton River near the mouth		V

Snare River at Inlet of Slemon Lake	V
Coppermine River at Bloodyfalls	V
Burnside River near the mouth	V
Back River below Beechy Lake	V
Talston River at outlet of Tsu Lake	V

SAMPLING MATRIX

Schema	LAB	Parms	All Stations (16)	All Tentative Stations (20)	Total
SA3	F	Phys(F)	V	V	204
SC1	B	Majorion	V	V	204
SC2	S	Phys(L)	V	V	204
SC3	S	NFR	V	V	204
SD2	S	Nutrients	V	V	204
SE1	B	T Metals	V	V	204
SE3	B	Fe-Mn(Ext)	V	V	204
SF3	B	As-Se(L)	V	V	204
SF4	S	B(L)	V	V	240
SG1	S	Cn	*	*	64
SH8	S	Phenols	*	*	34
		Radionuclides	*		1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
391-87 Mackenzie River Basin Bilateral Agreements

SUBMITTER - N/A
C&P PROGRAM - 1.1* - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES (1) To input to the development of bilateral agreements for the Mackenzie River Basin. (2) To participate, as required, in the design of studies and negotiation of implementation agreements as an advisor to the Mackenzie River Basin Task Force or as a member of specific working groups which may be formed.

RATIONALE WQB has the responsibility to provide data and analysis when requested on interprovincial river systems.

DESCRIPTION Data requests will be responded to and analysis and advice provided as requested by the Mackenzie River Basin Task Force.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.07		0.07
	PY Tech					
	Salary			3.2		3.2
	O & M			2.8		2.8
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.07		0.07
Total Dollars				6.0		6.0

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
392-87 Interjurisdictional Network Monitoring by WRB

SUBMITTER - 0003
ECS PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES (1) To conduct monthly or time of visit water quality sampling at the designated interjurisdictional locations. (2) To prepare the data collected from these sites for the detailed data reports.

RATIONALE WQB has aresponsibility to measure the water quality of interjurisdictional river systems.

DESCRIPTION Monthly or time of visit samples are collected for a wide spectrum of parameters. The governments concerned are notified of potential or real problems. The data are reviewed on an annual basis to assess the relative quality of the boundary streams.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.01		0.01
	PY Tech		0.08	0.03		0.11
	Salary		2.7	1.4		4.1
	O & M		1.4			1.4
	Capital		0.4			0.4
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.08	0.04		0.12
Total Dollars		12.2	4.5	1.4		18.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
392-87 Interjurisdictional Network Monitoring by WRB

INDICATORS - N/A
PRIORITY - Sample Turnaround Time 16 week

DISSEMINATION OF LABORATORY DATA REPORTS
1 Project Coordinator
2 WESTORE
3 NAQUADAT

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Update project description	February	
2 Undertake fieldwork	ongoing	Time of visit sampling
3 Lab Analysis	ongoing	Reports due 12 weeks from date of receipt of samples
4 Data verification	ongoing	
5 Review data and complete validation for data report		scheduliong in accordance with Project 3015

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
49	Slave River at Fitzgerald	00AL07NB0001	V
50	Hay River near Hay River	00NW070B0001	V
51	Liard River near the mouth	00NW10ED0002	V
80	Peel River above Fort Macpherson	00NW10MC0001	V
**	Hay River below Indin Lake (Proposed Station)	none yet assigned	V

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
392-87 Interjurisdictional Network Monitoring by WRB

SAMPLING MATRIX

Schema	LAB	Parms	Stn 49	Stn 50	Stn 51	Stn 80	Stn **	Totals
SA3	F	Phys(F)	V	V	V	V	V	43
SC1	B	MajorIon	V	V	V	V	V	43
SC2	S	Phys(L)	V	V	V	V	V	43
SC3	S	NFR	V	V	V	V	V	43
SD2	S	Nutrients	V	V	V	V	V	43
SE1	B	T Metals	V	V	V	V	V	43
SE3	B	Fe-Mn(Ext)	V	V	V	V	V	43
SF3	B	As-Se(L)	V	V	V	V	V	43
SF4	S	B(L)	V	V	V	V	V	43
SH1	B	Herbs(Old)	V					9
SH2	B	Herbs(New)	V					9
SH5	B	OC-PCB	V					9
SH8	S	Phenol	V					24
RADIONUCLIDES			V					1

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Cost per Schema	Proj 392 Samples	Proj 392 Cost
SA3	F	Phys(F)	0.00	43	
SC1	B	MajorIon	52.57	43	2260.51
SC2	S	Phys(L)	12.01	43	516.43
SC3	S	NFR	9.12	43	392.16
SD2	S	Nutrients	68.26	43	2935.18
SE1	B	T Metals	47.41	43	2038.63
SE3	B	Fe-Mn(Ext)	2.28	43	98.04
SF3	B	As-Se(L)	17.04	43	732.72
SF4	S	B(L)	5.76	43	247.68
SH2	B	Herbs(New)	270.00	9	2430.00
SH5	B	OC-PCB	183.60	9	1652.40
SH8	S	Phenol	14.41	24	345.84
TOTAL	S			196	4437.29
TOTAL	B			190	9212.30
G TOTAL				429	13649.59

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
393-87 NWT Water Quality Objectives Program

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES

(1)To participate in the promotion and negotiation of water quality objectives with the Mackenzie River Basin Bilateral Alta-NWT Committee. (2) To initiate and develop ongoing contacts for the purpose of promoting water quality objectives with Parks Canada and the NWT Water Board.

RATIONALE WQB has the responsibility to promote water quality objectives on all waters of federal interest, and to participate as required in their negotiation and implementation on interprovincial waters.

DESCRIPTION The data requests and analysis of transboundary water quality provided to the Mackenzie River Basin Task Force will be used to identify water quality objectives at the Alta-NWT boundary. Ongoing contacts with the NWT Water Board and Parks Canada will be maintained to promote the establishment of water quality objectives on additional watercourses in the NWT.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.07		0.07
	PY Tech					
	Salary			3.2		3.2
	O & M			1.0		1.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.07		0.07
Total Dollars				4.2		4.2

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
394-87 DOE - INAC Water Quality Agreement

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - 1985-87

OBJECTIVE To complete negotiations of a Canada - NWT water quality agreement with INAC.

RATIONALE IWD will seek a water quality agreement with INAC in order to: design a more cost-efficient monitoring network and data base: increase sampling capability where required: increase the comparability of water quality data between INAC and IWD: eliminate redundant monitoring: create an integrated data management system.

DESCRIPTION The Yellowknife office currently administers an informal agreement with INAC wherein WSC picks up samples from 21 stations at time of visit for delivery to INAC. The formal water quality agreement will rationalize and integrate the two water quality monitoring programs.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.15		0.15
	PY Tech					
	Salary			6.8		6.8
	O & M			2.0		2.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.15		0.15
Total Dollars				8.8		8.8

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
395-87 Nahanni National Park Monitoring Agreement

SUBMITTER - 0001
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing since April 1980

OBJECTIVES To collect water samples on a time of visit basis from the Flat River and tentatively from two South Nahanni River sites, to provide an overview of water quality characteristics.

RATIONALE IWD has a cost sharing Agreement with Parks Canada for hydrometric work in Nahanni Park. Included in this is the requirement for water quality monitoring on the Flat River. Funding status for the other two stations is as yet undetermined.

DESCRIPTION Time of visit sampling is carried out by WRB at the hydrometric stations.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.01		0.01
	PY Tech		0.03	0.01		0.05
	Salary		1.0	0.7		1.7
	O & M		0.5	0.4		0.9
	Capital		0.1			0.1
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.03	0.02		0.05
Total Dollars		2.3	1.7	1.1		5.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
395-87 Nahanni National Park Monitoring Agreement

INDICATORS - N/A
PRIORITY - Relative Rank 5. Sample Turnaround Time 16 weeks

DISSEMINATION OF LABORATORY DATA REPORTS
Project Coordinator
Parks Canada

ACTIVITIES/REPORTING CALENDAR
N/A

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
86	Flat River near the Mouth	00NW10EA0004	V
	South Nahanni River above Clausen Creek		V
	South Nahanni River upstream of Nahanni National Park		V

SAMPLING MATRIX

Schema	LAB	Parms	Stn 86	Stn	Stn	Totals
SA3	F	Phys(F)	V	V	V	18
SC1	B	MajorIon	V	V	V	18
SC2	S	Phys(L)	V	V	V	18
SC3	S	NFR	V	V	V	18
SD2	S	Nutrients	V	V	V	18
SE1	B	T Metals	V	V	V	18
SE3	B	Fe-Mn(Ext)	V	V	V	18
SF3	B	As-Se(L)	V	V	V	18
SF4	S	B(L)	V	V	V	18

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
396-87 Nahanni River Basin Study Plan

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - 1986/1987

OBJECTIVE To develop a plan for carrying out a baseline water quality survey in the South Nahanni River Basin.

RATIONALE IWD has the responsibility to provide information on emerging trends in all waters of federal interest. A baseline water quality survey of the S. Nahanni River Basin is necessary, in order to determine the natural chemical characteristics of the basin, prior to intensive mine development.

DESCRIPTION A study plan will be prepared with the assistance of the Regional Office of WQB, and in cooperation with Parks Canada, for a water quality survey in the South Nahanni River Basin, in FY 88/89.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.06		0.06
	PY Tech					
	Salary			2.7		2.7
	O & M			2.8		2.8
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.06		0.06
Total Dollars				5.5		5.5

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
397-87 MacKenzie River Hydrocarbon Survey

SUBMITTER - N/A
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - 1985 to 1988

OBJECTIVES To carry out a baseline water quality survey, focusing on station evaluations, heavy metals and hydrocarbons on the Mackenzie River.

RATIONALE IWD has the responsibility to provide information on emerging trends on all waters of federal interest. A baseline water quality survey on the Mackenzie River must be undertaken prior to anticipated intesinve mining and hydrocarbon development.

DESCRIPTION The study is being undertaken in conjunction with NWRI. The third survey will take place during the summer of 1987. Sediment and water column analysis for metals and hydrocarbons will be carried out by NWRI.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.10		0.10
	PY Tech					
	Salary			4.8		4.8
	O & M			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.10		0.10
Total Dollars				9.8		9.8

Affiliated C&P Program(s) - 1.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
397-87 MacKenzie River Hydrocarbon Survey

INDICATORS - N/A
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS
Project Coordinator

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Conduct an under ice survey of the Mackenzie River	March 15, 1988	
2 Complete interin evaluation report	February 1, 1988	

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
1	Liard River at the Mouth		
2	Mackenzie River at Ft Simpson		
3	Mackenzie River at Wrigley		
4	Mackenzie River above Ft Norman		
5	Mackenzie River above Norman Wells		
6	Mackenzie River at Norman Wells		
7	Mackenzie River above Ft Good Hope		
8	Mackenzie River at Ft Good Hope		
9	Mackenzie River at Arctic Red River		

SAMPLING MATRIX
Note: All analyses are to be funded by recoverable resources from NOGAP

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
398-87 Toxic Chemicals Survey

SUBMITTER - N/A
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - 1987/88

OBJECTIVES To conduct extensive sampling for toxic chemicals in a basin designated by the WRB/WPM and the WQB. This will enable us to better understand parameter flux during this period, and to assess the water quality in the basin.

RATIONALE

Parameter flux during freshet and summer flow represents an important data gap for the study of toxic particulates. The timing of the freshet survey with WRB high flow rating activities provides an opportunity to collect useful information in a cost-effective manner.

DESCRIPTION Sampling will be undertaken prior to breakup by WSC on an approximate daily basis. Subsequent samples will be taken during summer low flow periods.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.07		0.07
	PY Tech		0.11	0.04		0.15
	Salary		3.7	4.4		8.1
	O & M		1.9			1.9
	Capital		0.5			0.5
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.11	.11		.22
Total Dollars		22.6	6.0	4.4		33.0

Affiliated C&P Program(s) - 1.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
398-87 Toxic Chemicals Survey

INDICATORS - N/A
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS
N/A

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 In cooperation with WRB complete basin selection and logistical planning	April 15,1987	
2 Complete field work	Oct 15, 1987	
3 Prepare first draft of report using preliminary data, where available	Mar 31, 1988	
4 Print report	Mar 31, 1988	

STATION LIST
Note: stations have not yet been selected

SAMPLING MATRIX

Schema	LAB	Parms	Totals
SA3	F	Phys(F)	60
SC1	B	MajorIon	60
SC2	S	Phys(L)	60
SC3	S	NFR	60
SD2	S	Nutrients	60
SE1	B	T Metals	60
SE3	B	Fe-Mn(Ext)	60
SF3	B	As-Se(L)	60
SF4	S	B(L)	60
SH1	B	Herbs(Old)	20
SH2	B	Herbs(New)	20
SH5	B	OC-PCB	20
SH8	S	Phenol	20

Note: stations have not yet been selected

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1987/88
399-87 Development Projects Screening

SUBMITTER - N/A
C&P PROGRAM - 4.3 - Environment assessment and Baseline Studies
DURATION - Ongoing

OBJECTIVE To fulfil NWT program responsibilities for FEARO and RSCC project reviews.

RATIONALE IWD has the responsibility to advise on the suitability of project design when requested, in order to promote environmentally responsible development.

DESCRIPTION All NWT projects referred by FEARO and the RSCC will be reviewed and commented upon.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.09		0.09
	PY Tech					
	Salary			4.1		4.1
	Capital					
	O & M					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.09		0.09
Total Dollars				4.1		4.1

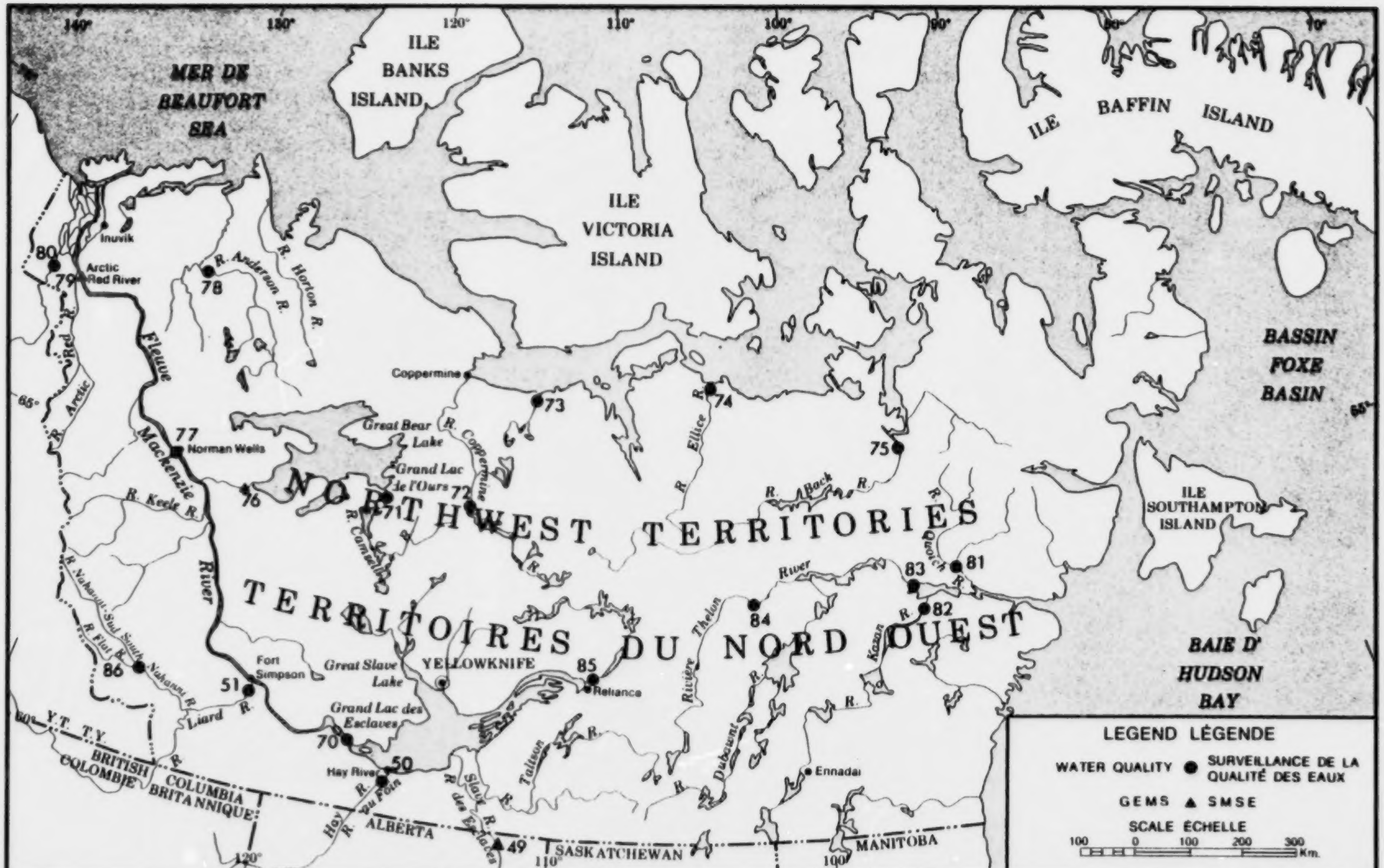


FIGURE 16 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

D.5 PACIFIC AND YUKON REGION

Région du Pacifique et du Yukon

PROJECT DESCRIPTION REGION P&Y
WATER QUALITY BRANCH - 1987/88 PROJECT NO. 1

PROJECT TITLE: BRANCH SUPPORT

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management/Water Quality Management Data/Toxic Chemicals

C&P CODE: 1.1/1.3/4.1

DURATION: Ongoing

STUDY TEAM: Branch Chief (Vacant)
G. Moyle, M. Henderson

TEL: 666-6038

GOALS: To provide common services to facilitate operations with the Branch.

RATIONALE: In order to maintain control over expenditures not directly attributable to specific projects, common services have been grouped in a Support Service category.

DESCRIPTION: Training, conferences, journal subscriptions and library stock will be supported at an appropriate level to ensure the availability of opportunities to maintain Branch expertise. Hydro and communication systems are provided, including telephones, telecopiers, etc. Inter-project coordination under various national programs is provided. Secretarial and technical support not specific to other projects, together with general management and planning functions are included. Fleet management, including gas/oil and maintenance services, will also be provided. Participation in producing and presenting public information is anticipated.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	2.0		2.0
PROF			
TOTAL PY	2.0		2.0
SALARIES	60.20		60.20
O&M	77.00		77.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	137.20		137.20

PROJECT DESCRIPTION — REGION — P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 2

PROJECT TITLE: WATER QUALITY OBJECTIVES

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management/Toxic Chemicals — C&P CODE: 1.1/4.1

DURATION: Ongoing

STUDY TEAM: D. Valiela, L.J. Zeman, D.D. MacDonald — TEL: 666-8002

GOALS:
1. To provide management with information for negotiating, establishing and maintaining water quality objectives on rivers where federal interest dictates by identifying uses, key water quality variables, toxic chemicals pollution, and its sources.
2. To determine trends in aquatic environmental quality and assess conformity with water quality requirements used to control municipal and industrial discharges to receiving waters.

RATIONALE: By participating in the development of Water Quality Objectives on international, interprovincial and interjurisdictional waters within the region the Water Quality Branch is promoting the wise use of those resources.

DESCRIPTION: a. Develop concepts and approaches to collect information and water quality data necessary to establish WQO's.
(i) Present a paper on considerations in the development of monitoring strategies to determine compliance with WQO's by May 31, 1987;
(ii) Submit journal manuscript by September 30, 1987.

b. Support HQ staff in developing concepts and approaches for WQO's by:
(i) Providing ongoing advice on Canadian Guidelines for Water Quality and support for workshop on guidelines by March 31, 1988;
(ii) Providing other support as required.

c. Develop, in cooperation with the B.C. Ministry of Environment and Parks, joint WQO's for rivers of significant national interest. Specifically to:
(i) Review about four (4) provincial WQO's documents, with emphasis on those basins of significant federal interest, by March 31, 1988.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.5		0.5
TOTAL PY	0.5		0.5
SALARIES	30.00		30.00
O&M	8.00		8.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	38.00		38.00

PROJECT DESCRIPTION — REGION — P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 3

PROJECT TITLE: FLATHEAD RIVER WQO's

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management/Water Quality Management Data/Toxic Chemicals — C&P CODE: 1.1/1.3/4.1

DURATION: 1 year

STUDY TEAM: D. Valiela, D.D. MacDonald — TEL: 666-8002

GOALS:
1. To provide management with information for negotiating, establishing and maintaining Water Quality Objectives on the Flathead River by identifying ambient levels and trends for key water quality variables.
2. Provide information on the possible impacts of development on water quality in the river.

RATIONALE: Impending development of coal resources in the Flathead River watershed is perceived as having considerable potential for impact on downstream users in the State of Montana through degradation of water quality. By participating in the formulation of WQO's for the Flathead, the Branch is promoting the wise use of that resource, and minimizing the potential for an international dispute.

DESCRIPTION: Using concepts and approaches developed, collect the information and water quality data necessary to establish Water Quality Objectives for the Flathead River. Specifically to:
a. Formulate provisional WQO's for sediments, toxic compounds of nitrogen and barium for the Flathead River by March 31, 1988.
b. Design a compliance monitoring program for those variables by March 31, 1988.
c. Complete draft on toxic metals criteria for fish in the Flathead River by March 31, 1988.
d. Provide support to I.J.C. as required.

A-BASE RESOURCES: ($'000) NON A-BASE RESOURCES: ($000)

	Sub-total	Sub-total	Total
PY TECH.			
PROF	0.9		0.9
TOTAL PY	0.9		0.9
SALARIES	55.00		55.00
O&M	6.00		6.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	61.00		61.00

PROJECT DESCRIPTION — REGION — P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 4

PROJECT TITLE: FLATHEAD RIVER WQO'S - SEDIMENT

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

DURATION: 1 year

STUDY TEAM: D.D. MacDonald, D. Valiela TEL: 666-8003

GOALS:
1. To provide management with information for negotiating, establishing and maintaining Water Quality Objectives on the Flathead River by identifying ambient levels and trends for water-borne and deposited sediments.
2. Provide information on the possible impact of development (and associated sediment) on water quality and beneficial water uses in the river.

RATIONALE: Impending development of coal resources, and ongoing gas exploration and timber harvesting activities in the Flathead River watershed are perceived as having considerable potential for impact on downstream users in the State of Montana through the degradation of water quality. Elevated levels of suspended sediment in water and deposited sediment in stream-bed substrates could have detrimental effects on beneficial water uses downstream of developments. By participating in the formulation of WQO's for sediment in the Flathead River basin, the Branch is promoting the wise use of the aquatic resource, and is thereby minimizing the potential for an international dispute.

DESCRIPTION: Using concepts and approaches developed, collect the information and water quality data necessary to establish WQO's for sediment designed to conserve and protect beneficial water uses, particularly fish and aquatic life, in the Flathead River basin. Specifically to:
a. Present a paper on development of water quality criteria for deposited sediments by March 31, 1988.

A-BASE RESOURCES: ($'000) NON A-BASE RESOURCES: ($000)

	Sub-total	Sub-total	Total
PY TECH.			
PROF	0.1		0.1
TOTAL PY	0.1		0.1
SALARIES	7.00		7.00
O&M	1.00		1.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	8.00		8.00

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 5

PROJECT TITLE: SIMILKAMEEN RIVER WQO'S

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management/Toxic Chemicals

C&P CODE: 1.1/4.1

DURATION: 1 year

STUDY TEAM: L.J. Zeman, D. Valiela, D.D. MacDonald

TEL: 666-8004

GOALS:
1. To develop an understanding of water pollutant - aquatic environment interactions arising from changes in water quality attributable to land and water uses to facilitate the formulation of water quality objectives specific to the border reach of the Similkameen River.

RATIONALE: As a significant Interior Plateau stream, the Similkameen River is subject to heavy pollutant loadings from agricultural, urban and particularily mining sources. Investigations of toxic metals and organics in water, sediment, and fish, and of periphyton growth will contribute to the understanding of the human and environmental risks associated with the amounts and forms of toxic chemicals released into the river. This information, in turn, will facilitate the formulation of water quality objectives designed to protect beneficial water uses (domestic, agricultural and fisheries uses), and thereby limit the impact of developments in Canada on downstream users in the State of Washington to an acceptable level.

DESCRIPTION: Using the appropriate concepts and approaches, collect, analyze and interpret information and water quality data necessary to formulate site-specific WQO's for the Similkameen River. Specifically to:
a. Formulate provisional site-specific water quality criteria for toxic metals in the Similkameen River by March 31, 1988.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.5		0.5
TOTAL PY	0.5		0.5
SALARIES	25.00		25.00
O&M	2.80		2.80
CONTRACTS	5.20		5.20
CAPITAL	-		-
TOTAL	33.00		33.00

PROJECT DESCRIPTION — REGION — P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 6

PROJECT TITLE: FRASER RIVER ESTUARY WQO'S

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management/Toxic Chemicals — C&P CODE: 1.1/4.1

DURATION: Ongoing

STUDY TEAM: D. Valiela, D.D. MacDonald, L.J. Zeman — TEL: 666-8002

GOALS:
1. To provide management with information for negotiating, establishing and maintaining Water Quality Objectives on the Fraser River Estuary by identifying ambient levels and trends for toxic chemicals.
2. To provide management with recommendations for improving water quality conditions in the Estuary.

RATIONALE: The Lower Fraser is the most important area in this Region, both in terms of population and economics. Preliminary work on the identification of organic contaminants in sediment and biota has indicated that levels of toxic chemicals in the aquatic ecosystem may be problematic. The establishment and maintenance of Water Quality Objectives on the Lower Fraser will promote the wise use of that resource, and thereby minimize the potential for health risks and conflicts among water users.

DESCRIPTION: Support DOE in developing a Water Quality Plan and approaches to establishing Water Quality Objectives through participation in the federal-provincial program. Specifically to:
a) Complete a status report on the information required to support formulation of WQO's for chlorophenols in the Fraser River Estuary by March 31, 1988.
b) Participate in the Water Quality Objectives Sub-Committee under FREMP as required.
c) Develop a conceptual framework for formulating WQO's on the Fraser River Estuary by March 31, 1988.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	1.0		1.0
TOTAL PY	1.0		1.0
SALARIES	10.50		10.50
O&M	5.00		5.00
CONTRACTS	14.00		14.00
CAPITAL	-		-
TOTAL	29.50		29.50

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION P&Y
PROJECT NO. 7

PROJECT TITLE: SURVEYS AND INTERPRETATION, DIVISION SUPPORT

NATIONAL PROGRAM NAME: C&P CODE: 4.1

DURATION:

STUDY TEAM: L.M. Churchland, T.M. Tuominen TEL: 666-8006
S.W. Sheehan

GOALS:

1. To provide professional advice and a regional perspective to headquarters management in developing national strategies for water quality monitoring, surveys, and assessments.

2. To provide support in planning and operations of the Water Quality Branch and Surveys and Interpretation Division.

RATIONALE: By providing input into policy decisions at the national level, the Branch is ensuring that Regional concerns are being considered and addressed. Planning and management are required to ensure the effective operations of the Surveys and Interpretation Division, and the Water Quality Branch.

DESCRIPTION: Attend meetings of Heads, Monitoring and Surveys Division and provide input, as required. Provide input to long-term operational plans, work plans; review proposals, reports, and correspondence; participate in meetings, workshops, staffing and job evaluations as required. Act as Chief, WQB, as required.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.5		0.5
TOTAL PY	0.5		0.5
SALARIES	21.40		21.40
O&M	6.00		6.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	27.40		27.40

PROJECT DESCRIPTION — REGION — P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 8

PROJECT TITLE: COLUMBIA RIVER - WATER CHEMISTRY AND MODELLING

NATIONAL PROGRAM NAME: Toxic Chemicals — C&P CODE: 4.1

DURATION:

STUDY TEAM: S.W. Sheehan, L.M. Churchland TEL: 666-8007

GOALS:
1. To interpret water chemistry data collected from previous surveys and provide recommendations for monitoring water quality conditions.
2. To enhance the design of a water quality model to estimate concentrations of relevant toxicants and associated variables in the Columbia River at Waneta, a water quality station located upstream of the U.S.-Canada Border.
3. To collect fish for the purpose of determining levels of metals in fish tissue.

RATIONALE: The interpretation of water chemistry data will assist in developing appropriate water quality monitoring programs. Fish collections are to be conducted in response to recommendations cited in a report published in 1987. Toxicants are discharged to the Columbia River under various flow conditions; model is required to estimate the toxicant levels at the Canada-U.S. border.

DESCRIPTION: A summary report covering the interpretation of data collected over the period of 1978-1984 is to be written. A proposal to improve the estimates of concentrations of toxicants at the Waneta station is to be prepared. One fish collecting trip will be undertaken to collect more data on levels of metals in fish tissue.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.5		0.5
TOTAL PY	0.5		0.5
SALARIES	21.40		21.40
O&M	1.50		1.50
CONTRACTS	12.00		12.00
CAPITAL	-		-
TOTAL	34.90		34.90

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 9

PROJECT TITLE: COLUMBIA RIVER - ALGAL ASSAY

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

DURATION: 1987-88

STUDY TEAM: T.M. Tuominen, S.W. Sheehan TEL: 980-6915
666-8005

GOALS:

1. To identify water quality conditions with respect to relationships between nutrients, metals and algal growth.

2. To identify potential concerns with respect to the above relationships and planned changes to metals inputs into the river.

RATIONALE: The Columbia River is a major international river that flow from British Columbia to the State of Washington, U.S.A. Concern has been identified about the introduction of nutrients and toxic metals into the river, especially in relation to possible detrimental effects on the water quality at the International boundary.

DESCRIPTION: An interpretive report will be completed in 1987-88. This report presents the results and interpretations of an algal assay study investigating the effects of nutrient and heavy metal discharges on the algal growth potential in the Columbia River, downstream of Trail, B.C.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.5		0.5
TOTAL PY	0.5		0.5
SALARIES	25.10		25.10
O&M	3.50		3.50
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	28.60		28.60

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 10

PROJECT TITLE: ENVIRONMENTAL REFERRALS

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

DURATION: 1987-88

STUDY TEAM: S.W. Sheehan, L.M. Churchland TEL: 666-8007

GOALS:

1. To provide professional advice and a Federal perspective on environmental contamination issues.
2. To provide advice in assessment of spills and the formulation of permits, with regard to receiving water conditions.
3. To provide advice on assessment approaches including modelling.

RATIONALE: By providing advice on water quality issues of national significance, the Branch promotes the wise use of aquatic resources.

DESCRIPTION: Advice on water quality concerns will be provided as required to WPM and other federal agencies, and to the provincial government, particularly with respect to the impact of discharge from Cominco, the lead-zinc smelter at Trail, B.C. on water quality conditions at the International border.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.1		0.1
TOTAL PY	0.1		0.1
SALARIES	6.00		6.00
O&M	-		-
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	6.00		6.00

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 11

PROJECT TITLE: FRASER RIVER

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

DURATION: 1987-88

STUDY TEAM: L.M. Churchland, T.M. Tuominen TEL: 666-8006
980-6915
666-8005

GOALS:
1. To provide input to the design of a federal-provincial water quality plan for the Fraser River Estuary.
2. To evaluate the use of toxicity screening tests to identify degraded and/or toxic conditions in the Fraser River.
3. To identify areas in the Fraser River where toxic or environmentally degraded conditions exist.

RATIONALE: The DOE toxic chemicals committee has designated top priority to the lower Fraser River and estuary with respect to concerns about toxic chemicals in the aquatic environment. The Fraser River supports several important uses including the largest commercial salmon run in Canada. A water quality plan for the estuary is required to maintain and, where necessary, improve the water quality. Sensitive toxicity screening methods that can indicate potentially toxic conditions in the ambient environment of the Fraser River are important to future monitoring in the river.

DESCRIPTION: IW/L representation will be provided to a Standing Committee which is responsible for designing a Water Quality Plan for the lower Fraser River. A joint survey with NWRI will be conducted to test toxicity screening methods on bed sediment and water samples collected from the Fraser River basin.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	1.5		1.5
TOTAL PY	1.5		1.5
SALARIES	64.10		64.10
O&M	4.00		4.00
CONTRACTS	5.00		5.00
CAPITAL	-		-
TOTAL	73.10		73.10

PROJECT DESCRIPTION — REGION P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 12

PROJECT TITLE: STATION EVALUATION ON THE QUINSAM RIVER

NATIONAL PROGRAM NAME: Water Quality Monitoring - Federal/Provincial Agreement — C&P CODE: 1.3

DURATION: 3 years

STUDY TEAM: T.L. Tremblay, L.M. Churchland TEL: 666-8008
A.C. Thorp

GOALS:
1. Evaluate present federal/provincial Water Quality monitoring station.
2. Initiate a recurrent river basin study.

RATIONALE: To evaluate the cost-effectiveness and usefulness of the data collection program for long-term trend assessment on the Quinsam River, at the new federal/provincial monitoring station.

DESCRIPTION: The Quinsam River is an important spawning and rearing area for salmon, and a major coal development is underway upstream. The Quinsam River has been monitored for water quality at its mouth since February, 1986, under the Canada/B.C. Water Quality Monitoring Agreement. The Station Evaluation will examine temporal and spatial variability, nutrient preservation, frequency of sampling, method of sample collection, and the appropriateness of the sampling site. In conjunction with Environmental Protection, baseline data will be collected at several sites on the River. It will then be possible to return after several years to determine the impact of major coal mining developments on water quality. Four field trips will be taken: two by September 30, 1987 and two by March 31, 1988.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.9		0.9
TOTAL PY	0.9		0.9
SALARIES	42.70		42.70
O&M	8.00		8.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	50.70		50.70

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 13

PROJECT TITLE: LABORATORY - DIVISION SUPPORT WORK

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

DURATION: Continuing

STUDY TEAM: F.T.S. Mah, G.Y.P. Kan TEL: 987-7756

GOALS: 1. To provide professional advice and a regional perspective to management in developing national strategies for laboratory operations.

RATIONALE: By providing input into policy decisions, regarding laboratory operations, at the national level, the Branch is ensuring that the Regional requirements for precise water quality data are being met.

DESCRIPTION: Attend national meetings of Divisional Heads and provide input, as required, to Analytical Services Division requests.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF	0.1		0.1
TOTAL PY	0.1		0.1
SALARIES	12.80		12.80
O&M	3.00		3.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	15.80		15.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO.

P&Y
14

PROJECT TITLE: LABORATORY MANAGEMENT

NATIONAL PROGRAM NAME: Water Quality Management
Data/Toxic Chemicals

C&P CODE: 1.3/4.1

DURATION: Continuing

STUDY TEAM: F.T.S. Mah, G.Y.P. Kan,
T. Tuominen

TEL: 987-7756

GOALS: 1. To provide laboratory facilities and services to ensure the continuing capability of the Regional operation.

RATIONALE: The management, administration, and common services associated with the Regional laboratory are identified as functions that are required to maintain an adequate capability to meet program needs.

DESCRIPTION: Common laboratory services provided include the maintenance of the laboratory, utilities, janitorial services, rent and tenant services, shipping and receiving, etc. Administrative functions provided include contracting-out, contracting-in as a service to other government agencies, cost accounting, cost recovery, budget control and technical administration. A quality control program will be maintained to ensure that the data produced are accurate and precise.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($000)	
	Sub-total	Sub-total	Total
PY TECH.	1.0		1.0
PROF	0.2		0.2
TOTAL PY	1.2		1.2
SALARIES	59.80		59.80
O&M	12.00		12.00
CONTRACTS	31.00		31.00
CAPITAL	-		-
TOTAL	102.80		102.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 15

PROJECT TITLE: INORGANIC CHEMISTRY

NATIONAL PROGRAM NAME: Water Quality Management Data/Toxic Chemicals

C&P CODE: 1.3/4.1

DURATION: Continuing

STUDY TEAM: F.T.S. Mah, E. Michnowsky, N.L. Wade

TEL: 987-7756

GOALS:

1. To provide capability to measure concentrations of inorganic constituents in water, sediment and biota; to conduct quality control programs required for trace metal samples forwarded to Burlington for analysis; to design and conduct quality control and quality assurance program required for federal/provincial and federal/territorial agreements; to provide advice on monitoring design and data interpretation related to water chemistry.

RATIONALE: By providing the capability to analyze for inorganic constituents in water, sediment and biota, instituting quality control programs for samples forwarded to the National Laboratory, and formulating and operating quality control-quality assurance program for federal/provincial and federal/territorial agreements, the Branch is strengthening its water quality data base, and is thereby providing information that will contribute to the wise use of the water resources in the Region.

DESCRIPTION: Support for inorganic analysis will be provided to Water Quality Branch projects. Quality control samples generated from the submissions to Burlington for analysis will be analyzed. Quality control-quality assurance program for federal/provincial and federal/territorial agreements will be designed and implemented. Samples generated from the program will be analyzed.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	1.6		1.6
PROF	0.2		0.2
TOTAL PY	1.8		1.8
SALARIES	76.90		76.90
O&M	4.00		4.00
CONTRACTS	48.00		48.00
CAPITAL	-		-
TOTAL	128.90		128.90

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION P&Y
PROJECT NO. 16

PROJECT TITLE: ORGANIC CHEMISTRY

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

DURATION: Continuing

STUDY TEAM: G.Y.P. Kan, F.T.S. Mah TEL: 987-3543

GOALS:
1. To provide expertise on sampling for toxic organic chemicals, such as pesticides and PCB's, to support the programs of the Water Quality Branch.
2. To support quality control programs for samples submitted to the Burlington laboratory for organic analysis and to provide advice and assistance on monitoring and interpretation of data related to toxic organic chemicals.

RATIONALE: By providing resources, quality control and chemical expertise for the analysis of toxic organic chemicals in the environment, the Branch is promoting the generation of meaningful information that will meet its responsibilities for the toxic chemicals program.

DESCRIPTION: Support in toxic organic chemicals will be provided by:
a. Conducting the quality control programs on samples submitted to Burlington for analysis by analyzing splits, spikes, blanks and standards;
b. Preparing samples by extraction and clean-up techniques for shipment to Burlington for analysis, when necessary;
c. Modifying previously developed sampling techniques to meet the needs of the Region;
d. Advising on sampling methodology to be used and interpretation of results;
e. Attending committee meetings and reviewing papers dealing with Toxic Chemicals Programs.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.2		0.2
TOTAL PY	0.2		0.2
SALARIES	8.50		8.50
O&M	4.00		4.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	12.50		12.50

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION P&Y
PROJECT NO. 17

PROJECT TITLE: TOXIC ORGANICS IN THE FRASER RIVER ESTUARY

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

DURATION: Continuing

STUDY TEAM: G.Y.P. Kan, F.T.S. Mah TEL: 987-3543

GOALS:
1. To carry out pilot studies required for the measurement of levels of toxic organic compounds in the Fraser River Estuary water.
2. To conduct interlaboratory study for chlorophenols in fish tissue.

RATIONALE: The lower Fraser is the most important area in this Region. With the exception of the limited work done under contract in 1983-85 and 1986-87 and the chlorophenol investigation by N.W.R.I. in 1984-87 very little is known about the toxic organics in the lower Fraser waters. In view of the importance of the Fraser it is warranted to assign resources to investigate the toxic organics in the Fraser River Estuary water.

DESCRIPTION: A comparison of two different methods of sampling chlorophenol contaminants in water (solvent extraction and resin adsorption) will be made when NWQL in Burlington has completed the development of the methodology for sampling of chlorophenols in water using the insitu solvent extraction technique. Two or more trips to the Fraser River Estuary will be conducted so that spike and recovery studies on chlorinated phenols using the two methods can be made. In addition an interlaboratory study will be conducted on chlorophenols in fish tissue when analytical methodology is available from NWQL.

When and if supplementary resources are available the following studies will be made:

a. A survey of chlorophenol and dioxin contamination in the environment near wood treatment facilities on the lower Fraser River and Vancouver Island will be made (a C&P project).
b. The stability of dinoseb in the aquatic environment will be investigated after the pesticide is experimentally sprayed.

	A-BASE RESOURCES: ($'000) Sub-total	*NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.8	0.2	1.0
TOTAL PY	0.8	0.2	1.0
SALARIES	34.20	8.50	42.70
O&M	1.50	1.50	3.00
CONTRACTS	5.00	** 40.00	45.00
CAPITAL	-	-	-
TOTAL	40.70	50.00	90.70

* These two projects are contingent on receipt of supplementary resources. Funding of these two projects will result in 0.2 PY's and $4.0 O&M of A base being diverted from other Toxic Chemicals projects.

** Supplementary resources for IW/L portion of work for this C&P project.

Project Resources

	Part B1* 4.1	Part B2* 4.1
PY TECH.	0.0	0.0
PROF	0.1	0.1
TOTAL PY	0.1	0.1
O&M	0.5	1.5
SUPPLEMENTARY ANALYTICAL RESOURCES	10.0	30.0
TOTAL	10.5	31.5

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION P&Y
PROJECT NO. 18

PROJECT TITLE: BIOLOGY

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

DURATION: Continuing

STUDY TEAM: T. Tuominen, F.T.S. Mah TEL: 980-6915
666-8005

GOALS:

1. To adapt biological techniques for monitoring of water quality
2. To apply biological techniques to surveys within the Branch's mandates where problems associated with toxic chemcials may be of concern.

RATIONALE: The advantages of using biological measurements for monitoring toxic chemicals in the aquatic environment warrant the inclusion of biological techniques in toxic chemicals monitoring projects.

DESCRIPTION: In 1987-88 the following activities will be conducted:

a. Samples collected from the Fraser River will be prepared for toxicity testing procedures.
b. Equipment will be prepared for biological sampling in the Fraser River.
c. Particle size analysis will be completed on suspended sediment samples collected in 1986-87.
d. interpretation will be provided for biological results and queries.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.2		0.2
TOTAL PY	0.2		0.2
SALARIES	8.50		8.50
O&M	4.00		4.00
CONTRACTS	9.00		9.00
CAPITAL	-		-
TOTAL	21.50		21.50

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 19

PROJECT TITLE: LABORATORY RELOCATION

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

DURATION: 1987-88

STUDY TEAM: F.T.S. Mah, E. Michnowsky TEL: 987-7756

GOALS: To plan for a new laboratory facility and to relocate into new facility to meet Regional needs.

RATIONALE: By participating in the planning activities associated with the relocation of the Regional laboratory facilities, and relocating into new facilities, the Branch is ensuring that the requirements for analytical services will be met.

DESCRIPTION: A new laboratory facility will be planned in conjunction with the Department of Public Works and Facilities Management. The new facility will be occupied by end of fiscal year.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	0.2		1.6
PROF	0.1		0.1
TOTAL PY	0.3		0.3
SALARIES	12.80		12.80
O&M	-		-
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	12.80		12.80

PROJECT DESCRIPTION — REGION P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 20

PROJECT TITLE: CHLOROPHENOLS IN PRECIPITATION IN FRASER RIVER ESTUARY

NATIONAL PROGRAM NAME: Toxic Chemicals — C&P CODE: 4.1

DURATION: 1987-?

STUDY TEAM: F.T.S. Mah, N.L. Wade — TEL: 987-7756

GOALS:

1. To determine the feasibility of using the XAD7 resin to collect chlorophenols in precipitation.
2. To collect chlorophenol concentrations in precipitation in the Fraser River estuary.

RATIONALE: Fraser River Estuary Management Agreement was signed in 1985. Regional Toxic Chemicals Coordinating Committee identified chlorophenols as one of the major concerns in the Region. By determining the chlorophenols in precipitation, one of the sources that contribute to the concentration of these compounds in the aquatic environment will be identified.

DESCRIPTION: A manual organic particpation sampler will be set up using XAD7 resin. Two recovery studies will be conducted using chlorophenol standards. When the sampling method is perfected, nine precipitation samples will be collected from Fraser River estuary for chlorophenol analysis.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.	0.2		0.2
PROF	0.2		0.2
TOTAL PY	0.4		0.4
SALARIES	17.00		17.00
O&M	4.50		4.50
CONTRACTS			-
CAPITAL	-		-
TOTAL	21.50		21.50

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION P&Y
PROJECT NO. 21

PROJECT TITLE: MONITORING DIVISION SUPPORT

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: P.H. Whitfield, A.C. Thorp TEL: 666-8009

GOALS: 1. To provide services of a general nature not attributable to specific projects.

RATIONALE: In order to maintain control over expenditures not directly attributable to specific projects.

DESCRIPTION: Overhead activities such as planning etc. of a divisional nature which cannot be directly attributed to a specific project. This activity also covers the cost of travel necessary to participate in national meetings of Divisional Heads.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF	0.1		0.1
TOTAL PY	0.1		0.1
SALARIES	4.30		4.30
O&M	2.50		2.50
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	6.80		6.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION P&Y
PROJECT NO. 22

PROJECT TITLE: FEDERAL QUALITY ASSURANCE

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: A.C. Thorp, N.J. Rousseau TEL: 666-8010

GOALS: 1. To provide assurance for routine monitoring sites, ensuring that valid data are being gathered at each site.

RATIONALE: Maintaining a high standard of data for use in national overviews that may be required to respond to federal needs in developing general policy and legislation.

DESCRIPTION: Collection of duplicate samples and site visits will be undertaken.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.2		0.2
TOTAL PY	0.2		0.2
SALARIES	10.50		10.50
O&M	1.00		1.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	11.50		11.50

PROJECT DESCRIPTION — REGION — P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 23

PROJECT TITLE: FEDERAL WATER QUALITY MONITORING, BRITISH COLUMBIA

NATIONAL PROGRAM NAME: Water Management Data — C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: A.C. Thorp, N.J. Rousseau — TEL: 666-8010

GOALS:
1. To provide continuing and pertinent water quality data responding to federal needs and interests in British Columbia, and where there is a potential for interjurisdictional disputes.

RATIONALE: A national overview of water quality conditions which can be used to respond to federal needs in developing general policy and legislation is required. Sampling at selected stations on a continuing basis also exhibits the federal presence and concern for water quality.

DESCRIPTION: Federal monitoring of a specific set of water quality variables at sites on interjurisdictional, international (transboundary), interprovincial and provincial-territorial reaches is done with the cooperation of the Water Resources Branch and other agencies.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.4		0.4
TOTAL PY	0.4		0.4
SALARIES	19.10		19.10
O&M	8.00		8.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	27.10		27.10

FEDERAL WATER QUALITY MONITORING, BRITISH COLUMBIA
STATION DESCRIPTION

May 1987

MAP NUMBER	STATION LOCATION	NAQUADAT NUMBER	LATITUDE	LONGITUDE	SAMPLING FREQUENCY	PARAM.
6	Bear River at Stewart	00BC08DC0001	55 57 15	129 58 23	5	Variable
2	Beaver R. upstream of Hwy. Br.	(TBA)	-	-		-
7	Big Sheep Creek at Highway Bridge	00BC08NE0010	49 00 55	117 56 39	5	Variable
8	Boundary Creek at Midway	00BC08NN0010	49 00 06	118 45 38	5	Variable
9	Columbia River at Donald	00BC08NB0001	51 29 03	117 10 48	26	Variable
10	Fraser River at Red Pass	00BC08KA0007	52 59 17	119 00 33	26	Variable
3	Illecillewaet R. at Hwy Br.	(TBA)	-	-		-
11	Iskut River below Johnson River	00BC08CG0001	56 44 20	131 40 23	6	Variable
12	Kettle River at Carson	00BC08NN0021	49 00 00	118 29 48	26	Variable
13	Kettle River at Gilpin	00BC08NN0022	49 00 29	118 18 11	26	Variable
14	Kettle River at Midway	00BC08NN0011	49 00 16	118 46 28	26	Variable
4	Kicking Horse R. above Field	(TBA)	-	-		-
48	Kootenay R. above Vermillion R.	(TBA)	-	-		-
15	Liard River at Lower Crossing	00BC10BE0004			6	Variable
16	Moyie River at Kingsgate	00BC08NH0010	49 00 16	116 57 46	5	Variable
17	Pend D'Oreille River at Waneta	00BC08NE0029	49 00 11	117 37 00	13	Variable
18	Sage Creek at Road Bridge	00BC08NP0006	49 04 13	114 27 55	13	Variable
19	Skagit River 2 km above Bdy Obelisk	00BC08PA0001	49 01 14	121 03 38	5	Variable
20	Stikine River above Choquette River	00BC08CF0002	56 49 45	131 45 50	6	Variable
21	Sumas River at Huntington	00BC08MH0027	49 00 10	122 13 50	13	Variable

#PROJECT DESCRIPTION REGION P&Y
WATER QUALITY BRANCH - 1987/88 PROJECT NO. 24

PROJECT TITLE: FEDERAL WATER QUALITY MONITORING, YUKON

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: A.C. Thorp, N.J. Rousseau TEL: 666-8010

GOALS: 1. To provide continuing and pertinent water quality data responding to federal needs and interests in the Yukon, and where there is a potential for interjurisdictional disputes.

RATIONALE: A national overview of water quality conditions which can be used to respond to federal needs in developing general policy and legislation is required. Sampling at selected stations on a continuing basis also exhibits the federal presence and concern for water quality.

DESCRIPTION: Federal monitoring of a specific set of water quality variables at sites on interjurisdiction, international (transboundary), and provincial-territorial reaches is done with the cooperation of the Water Resources Branch and other agencies.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF	0.3		0.3
TOTAL PY	0.3		0.3
SALARIES	12.80		12.80
O&M	3.00		3.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	15.80		15.80

FEDERAL WATER QUALITY MONITORING, YUKON
STATION DESCRIPTION

MAP NUMBER	STATION LOCATION	NAQUADAT NUMBER	LATITUDE	LONGITUDE	SAMPLING FREQUENCY	PARAMETERS
24	Liard River at Fort Liard, N.W.T.	00NW10ED0001	64 14 35	123 28 45	13	Variable
23	Liard River at Upper Crossing	00YT10AA0001	60 03 00	128 53 58	6	Variable
22	Swift R. at BC-Yukon Border	00BC09AE0009	59 55 54	131 45 43	6	Variable
25	Teslin River at Johnson's Crossing	00YT09AE0001	60 29 07	133 18 02	6	Variable
26	Yukon River at Eagle, Alaska	00AK09ED0001	64 47 20	141 11 48	26	Variable
49	Yukon R. at Marsh Lake	00YT09AB0006				
50	Yukon R. at Carmacks	00YT09AH0001				

PROJECT DESCRIPTION — REGION P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 25

PROJECT TITLE: MONITORING EVALUATIONS AND STRATEGIES

NATIONAL PROGRAM NAME: Water Management Data — C&P CODE: 1.3

DURATION:

STUDY TEAM: P.H. Whitfield, D. Valiela — TEL: 666-8009

GOALS: 1. To provide assurance that monitoring strategies employed in monitoring programs are adequate to meet the ascribed goals of monitoring at each of the sites.

RATIONALE: Ensuring that the data gathering programs are maximizing the return on the investment of resources.

DESCRIPTION: Evaluations of statistical techniques and designs in relation to the desired goal of monitoring, evaluation of sampling frequency in relation to the goals of monitoring.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF	0.4		0.4
TOTAL PY	0.4		0.4
SALARIES	21.20		21.20
O&M	1.50		1.50
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	22.70		22.70

PROJECT DESCRIPTION REGION P&Y
WATER QUALITY BRANCH - 1987/88 PROJECT NO. 26

PROJECT TITLE: COASTAL STREAM STRATEGIES

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: P.H. Whitfield, N.J. Rousseau TEL: 666-8009

GOALS: 1. To provide assurance that monitoring strategies employed in monitoring programs are adequate to meet the ascribed goals of monitoring of coastal streams.

RATIONALE: Ensuring that the data gathering programs are maximizing the return on the investment of resources.

DESCRIPTION: Evaluations of statistical techniques and designs in relation to the desired goal of monitoring, evaluation of sampling frequency in relation to the goals of monitoring.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.3		0.3
TOTAL PY	0.3		0.3
SALARIES	12.80		12.80
O&M	1.50		1.50
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	14.30		14.30

PROJECT DESCRIPTION — REGION P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 27

PROJECT TITLE: COMPUTER SERVICES ACTIVITIES

NATIONAL PROGRAM NAME: Water Management Data — C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: J.N. Kuo, P.H. Whitfield — TEL: 666-8011

GOALS:
1. To provide services of a general nature not attributable to specific projects, and provide support to the Directorate by participation in the Information Technology Committee (ITC).

RATIONALE: In order to maintain control over expenditures not directly attributable to specific projects. Participation in the ITC will allow us to provide input in areas which affect our operations or areas where we can assist others with their needs.

DESCRIPTION: This activity primarily covers the cost of travel necessary to participate in national meetings of the ITC and PY for regional EDP coordination. Specifically it will include the following: provide regional input to the ITC-IWD on a variety of issues and topics as they arise; attend the ITC meetings in Ottawa twice yearly to voice regional concerns; prepare the annual Information Technology and Systems Plan for SID which becomes part of the Department's submission to Treasury Board; produce regional plans and recommendations for multibranch facilities; comment on proposed EDP acquisitions by the branches.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.2		0.2
TOTAL PY	0.2		0.2
SALARIES	8.50		8.50
O&M			
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	8.50		8.50

PROJECT DESCRIPTION — REGION P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 28

PROJECT TITLE: COMPUTER SERVICES

NATIONAL PROGRAM NAME: Water Management Data — C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: J.N. Kuo, P.H. Whitfield — TEL: 666-8011

GOALS:

1. To provide general computer services to facilitate the working operations of the Branch. To take advantage of computerized functions where these can increase branch productivity.

RATIONALE: This computer services project has facilitated our ability to provide computing services to the branch. We have acquired additional in-house terminals with high speed error-free access to service bureaux facilities. The Branch is in a position to negotiate favourable contracts with these services thereby controlling expenditures, and enhancing the usefulness of these facilities. In addition services are being provided by microcomputers which are contributing a growing portion of computing capabilities to the branch because of their low cost and widely available, inexpensive software.

DESCRIPTION: Support for computer processing of water quality data through software and system utilities. Specific projects and results: continued staff training on the use of both microcomputer and mainframe software; development of a water quality data base system using the ORACLE relational database management system and report on the implementation.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.3		0.3
TOTAL PY	0.3		0.3
SALARIES	12.80		12.80
O&M	48.00		48.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	60.80		60.80

PROJECT DESCRIPTION — REGION P&Y
WATER QUALITY BRANCH - 1987/88 — PROJECT NO. 29

PROJECT TITLE: ELECTRONIC DATA ACQUISITION - FIELD

NATIONAL PROGRAM NAME: Water Management Data — C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: N.E. Rousseau, P.H. Whitfield TEL: 666-8012

GOALS:

1. To demonstrate effective operation of a continuous monitoring electronic water quality station with telephone and telemetry capabilities.

2. To establish a satellite data gathering platform to enable the testing of new technology in data gathering.

RATIONALE: There is a potential for reducing the costs of certain monitoring efforts through new technology. Testing and development of this new technology is the first step in realizing the potential savings.

DESCRIPTION: Select a versatile data acquisition device which can be programmed by the user to suit various study conditions. Redesign enclosure for sensors. Deploy and test modems which allow for remote polling of field data acquisition devices. Review available information on existing satellite, shortwave, and land mobile satellite technology and prepare a proposal for acquisition of necessary equipment to allow use of field devices with satellite platform or telemetry equipment. Negotiate with Water Resources Branch for use in methods development and equipment testing.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.1		0.1
TOTAL PY	0.1		0.1
SALARIES	4.30		4.30
O&M	7.50		7.50
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	11.80		11.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 30

PROJECT TITLE: FEDERAL/PROVINCIAL AGREEMENT, BRITISH COLUMBIA

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: P.H. Whitfield, N.J. Rousseau TEL: 666-8009

GOALS:
1. Assist and participate in negotiations with the Province of British Columbia for a cost-shared water quality agreement.

RATIONALE: Supporting a federal policy to integrate with the provinces in providing complete and harmonized data from across Canada on a cost-shared basis which will respond to the specific requirements of the federal bureaucracy and reduce the potential for duplicating the expenditure of effort and resources by the two levels of government.

DESCRIPTION: Discussions with provincial representatives to formulate a list of joint monitoring activities, variables to be measured and development of monitoring strategies suitable for the monitoring objectives at each site.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.3		0.3
TOTAL PY	0.3		0.3
SALARIES	12.80		12.80
O&M	2.00		2.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	14.80		14.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION P&Y
PROJECT NO. 31

PROJECT TITLE: FEDERAL/PROVINCIAL QUALITY ASSURANCE BRITISH COLUMBIA AGREEMENT

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: N.J. Rousseau, A.C. Thorp TEL: 666-8012

GOALS: 1. To provide assurance for routine monitoring at Federal/ Provincial sites, ensuring validity and compatibility of all data collected under the agreement.

RATIONALE: Maintaining a high standard of data for use in national and provincial overviews that may be required to respond to federal and/or provincial needs in developing general policy and legislation.

DESCRIPTION: As described in the Federal/Provincial agreement, schedule E.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.3		0.3
TOTAL PY	0.3		0.3
SALARIES	12.80		12.80
O&M	3.0		3.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	15.80		15.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION
PROJECT NO. P&Y 32

PROJECT TITLE: FEDERAL/PROVINCIAL MONITORING
BRITISH COLUMBIA

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: N.J. Rousseau, A.C. Thorp IEL: 666-8012

GOALS:
1. To achieve a continuing commitment by the federal and provincial governments to the acquisition of water quality data and to obtain scientifically sound water quality information and achieve compatability between respective water quality data bases for water resources management purposes.

RATIONALE: To provide for the coordination and integration of federal and provincial water quality monitoring activities to develop comprehensive assessment on the quality of the aquatic environment in a cost-shared and work-shared manner.

DESCRIPTION: Monitoring of a specific set of water quality variables at fixed intervals on a continuing basis at sites described in the federal/provincial agreement.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	1.4		1.4
TOTAL PY	1.4		1.4
SALARIES	51.40		51.40
O&M	23.00		23.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	74.40		74.40

FEDERAL/PROVINCIAL WATER QUALITY MONITORING
STATION DESCRIPTION

MAP NUMBER	STATION LOCATION	NAQUADAT NUMBER	LATITUDE	LONGITUDE	SAMPLING FREQUENCY	PARAM.
27	Fraser River at Hansard	00BC08KA0001	54 04 39	121 50 48	26	Variable
28	Fraser River at Marguerite	00BC08MC0001	52 31 48	122 26 33	26	Variable
29	Fraser River at Hope	00BC08MF0001	49 23 14	121 27 03	26	Variable
30	Nechako River at Prince George	00BC08KE0010	53 55 38	122 45 54	26	Variable
31	Thompson River at Spences Bridge	00BC08LF0001	50 25 15	121 20 29	26	Variable
32	Peace River above Alces River	00BC07FD0005	56 07 34	120 03 22	26	Variable
33	Skeena River at Usk	00BC08EF0001	54 38 02	128 24 33	26	Variable
34	Quinsam River near the Mouth	00BC08HD0004	50 02 16	125 17 35	26	Variable
35	Columbia River at Revelstoke	00BC08ND0002	51 00 20	118 13 06	13	Variable
36	Columbia River at Birchbank	00BC08NE0005	49 10 37	117 43 03	26	Variable
37	Columbia River at Waneta	00BC08NE0001	49 01 40	117 36 10	52	Variable
1	Flathead River at US Border	00BC08NP0003	49 00 15	114 28 45	52	Variable
38	Kootenay River at Canal Flats	00BC08NF0006	50 08 51	115 47 58	26	Variable
39	Kootenay River at Fenwick Station	00BC08NG0009	49 31 41	115 32 52	26	Variable
40	Koocanusa Lake at US Border	01BC08NG0001	48 59 55	115 10 48	7	Variable
41	Kootenay River at Creston	00BC08NH0005	49 07 01	116 34 46	26	Variable
42	Elk River at Hwy 93 Bridge	00BC08NK0003	49 10 46	115 09 52	26	Variable
43	Okanagan River at Oliver	00BC08NM0001	49 06 52	119 33 54	26	Variable
5	Similkamen River near U.S. Border	00BC08NL0005	49 04 46	119 42 28	26	Variable
44	Old Wolf Lake (Victoria)	01BC08HA0001	48 30 00	123 40 05	12	Variable
45	Lizard Lake near Port Renfrew	01BC08HA0002	48 36 20	124 13 20	12	Variable
46	Spectacle Lake near Malahat Summit	01BC08HA0003	48 34 41	123 34 07	12	Variable
47	Maxwell Lake, Saltspring Island	01BC08HA0004	48 49 19	123 32 12	12	Variable

PROVINCIAL STATIONS

NAQUADAT # NOT ASSINED YET
SYSTEM FOR ENVIRONMENT ASSESSMENT MANAGEMENT (IT IS THE PROVINCIAL EQUIVALENT OF NAQUADAT).

S T A T I O N S C H A R A C T E R I S T I C S

STATION	NAQUADAT	SEAM	LATITUDE	LONGITUDE
WESTWOOD LAKE NEAR NANAIMO		E206289	49 09 40	124 00 00
STOCKING LAKE NEAR LADYSMITH		E2062900	48 57 30	123 49 07
JACOBS LAKE (MARION) MAPLE RIDGE			49 18 40	122 32 46
ROLLEY LAKE NEAR WHONNOCK			49 14 40	122 23 15
BUTTLE LAKE AT GOLD RIVER BRIDGE		0130080	49 50 33	125 37 15
COWICHAN RIVER AT OUTLET OF COWICHAN LAKE		E206108	48 49 25	124 03 30
COWICHAN RIVER AT HIGHWWAY 1		0120802	48 46 19	123 41 47
COWICHAN RIVER 1 KM D/S SOMENOS CREEK		E206106	48 46 26	123 39 58
BESSETTE CREEK U/S LUMBY STP		0500293	50 15 09	118 57 37
DEEP CREEK U/S DUTCH DAIRIES		0500258	50 26 46	119 12 17
DEEP CREEK NEAR MOUTH		0500020	50 20 49	119 17 39
BAILEY CREEK, VERNON		0500901	50 10 47	119 20 21
BRANDT'S CREEK, KELOWNA		0500319	49 53 45	119 28 56
OKANAGAN RIVER AT HIGHWAY 97 PENTICTON		0500050	49 29 46	119 36 58
SHINGLE CREEK AT MOUTH NEAR PENTICTON		0500066	49 28 46	119 35 56
ELLIS CREEK U/S OKANAGAN RIVER		050027	49 28 36	119 35 43
SIMILKAMEEN RIVER U/S PRINCETON STP		0500724	49 27 39	120 28 55
SIMILKAMEEN RIVER U/s KEREMEOS		0500692	49 12 01	119 50 29
SIMILKAMEEN RIVER 3600M D/S KEREMEOS		0500693	49 11 45	119 47 10
BOUNDARY CREEK U/S GREENWOOD		0200500	49 05 44	118 40 39
BOUNDARY CREEK 3 KM SOUTH GREENWOOD		0200501	49 03 31	118 41 36
KETTLE RIVER U/S GRAND FORKS STP		0200149	49 01 46	118 25 45
WILLOW RIVER AT HIGHWAY 26 NEAR WELLS		0600133	53 06 08	121 34 08
LITTLE HORSEFLY RIVER AT ROAD		0800003	52 22 26	121 19 20
LITTLE HORSEFLY RIVER BELOW LAKE		0800015	52 22 17	121 20 09
LITTLE HORSEFLY RIVER ABOVE GARDNER ROAD		0800004	52 21 38	121 23 35
DRAGON LAKE NEAR QUESNEL		0603017	52 57 25	122 24 37

WILLIAMS LAKE RIVER AT LAKE OUTLET	0600013	52 07 19	122 07 50
WILLIAMS LAKE RIVER NEAR MOUTH	0600529	52 09 52	122 16 08
ELK RIVER U/S ELKFORD STP	0200218	50 01 08	114 54 43
ELK RIVER ABOVE SPARWOOD STP	0200103	49 43 51	114 54 00
LINE CREEK NEAR THE MOUTH	0200044	49 53 34	114 49 32
FORDING RIVER AT MOUTH	0200396	49 53 09	114 52 23
ALEXANDER CREEK U/S MICHEL CREEK	0200430	49 40 24	114 46 46
MICHEL CREEK U/S ALEXANDER CREEK	0200429	49 40 27	114 46 48
MICHEL CREEK AT NATAL BRIDGE	0200025	49 43 45	114 51 22
ELK RIVER D/S LIZARD CREEK	0200397	49 27 11	115 04 01
KOOTENAY LAKE, CAPE HORN	0200034	49 35 58	116 50 49
KOTTENAY LKAE AT FRASER RAPIDS	0200012	49 37 03	116 59 34
LAKELSE RIVER ABOVE SKEENA RIVER	0400211	54 26 32	128 45 42
KITIMAT RIVER AT KITMAT	0430025	54 03 24	128 40 53
KISPIOX RIVER AT VILLAGE	0400205	55 20 50	127 41 49
BULKLEY RIVER NEAR HOUSTON	0400296	54 23 48	126 42 33
BULKLEY RIVER AT QUICK	0920088	54 37 04	126 53 48
TELKWA RIVER AT TELKWA	0400187	54 41 42	127 03 12
MORICE RIVER ABOVE BULKLEY RIVER	0400203	54 22 32	126 44 55
FRASER AT RIVER AT STONER	E206182	53 28 18	122 39 52
SHUSWAP RIVER D/S ENDERBY	0500498	50 33 49	119 08 30
VERNON CREEK AT KAL LAKE OUTLET			
COLDSTREAM CREEK			

* NOTE: List represents stations sampled in 1986-87.
For 1987-88 some changes can be expected.

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/88

REGION P&Y
PROJECT NO. 33

PROJECT TITLE: FEDERAL/TERRITORIAL AGREEMENT, YUKON

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

DURATION:

STUDY TEAM: P.H. Whitfield, N.J. Rousseau TEL: 666-8009

GOALS: 1. Assist and participate in negotiations with Indian and Northern Affairs in the Yukon for a cost-shared water quality agreement.

RATIONALE: Supporting federal policy to integrate with the provinces and territories to provide complete and harmonized data from across Canada on a cost-shared basis which will respond to the specific requirements of the federal bureaucracy and reduce the potential for duplicating the expenditure of effort and resources by the two levels of government.

DESCRIPTION: Discussions with INAC representatives to formulate a list of joint monitoring activities, variables to be measured and development of monitoring strategies suitable for the monitoring objectives at each site.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF	0.3		0.3
TOTAL PY	0.3		0.3
SALARIES	12.80		12.80
O&M	5.50		5.50
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	18.30		18.30

FIGURE 17 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

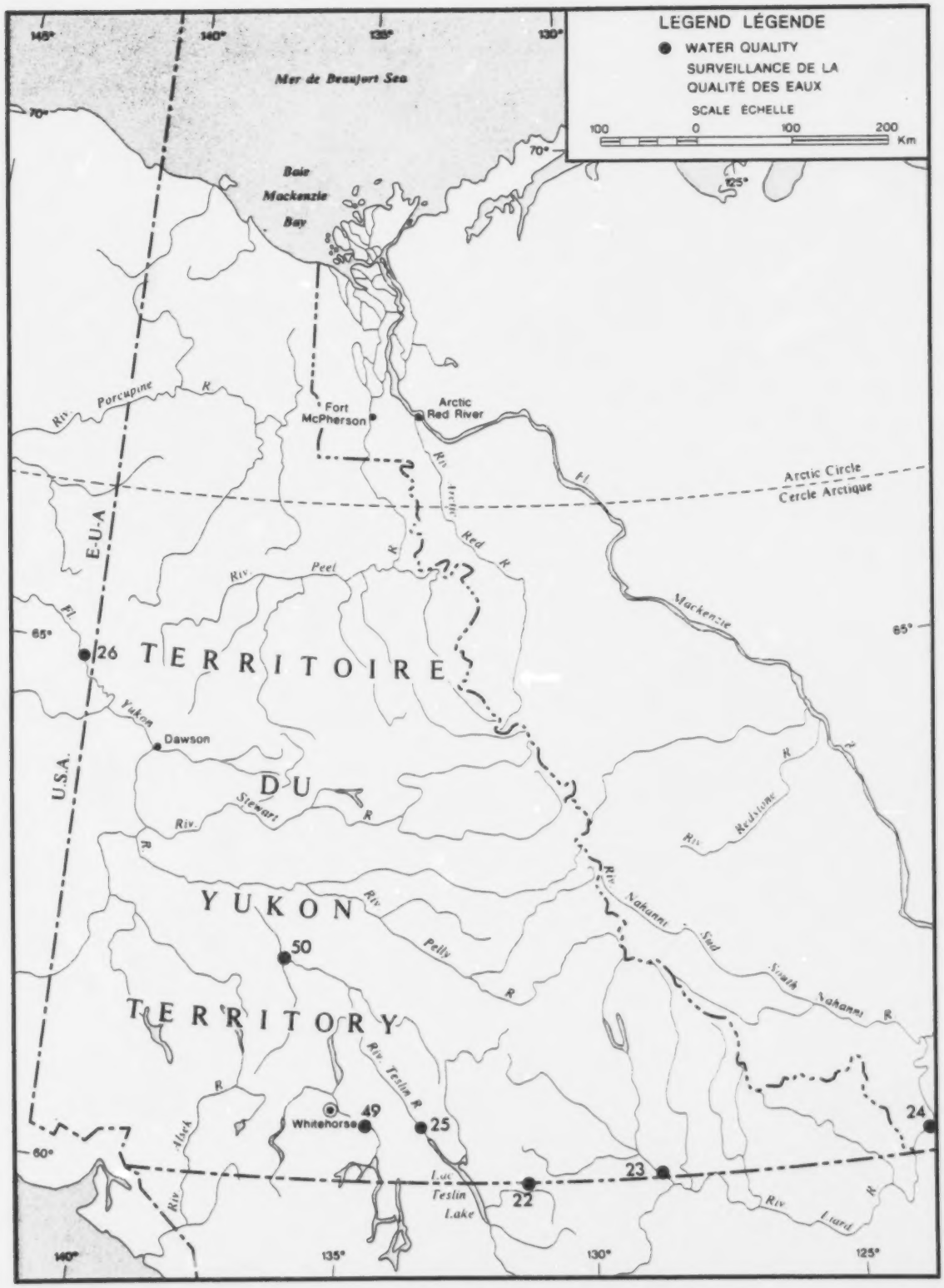


FIGURE 18 WATER QUALITY BRANCH MONITORING STATIONS
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX

D.6 HEADQUARTERS

Administration central

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/88

REGION/HQ HQ
PROJECT NUMBER DIR-1

PROJECT TITLE: WQB - MANAGEMENT AND ADMINISTRATION

NATIONAL PROGRAM NAME: Management and Administration C&P CODE: 1.6

DURATION: Ongoing

STUDY TEAM: Director's Office TEL: (819) 997-1920

GOALS:

Ensure effective and efficient Management of all aspects of Water Quality Branch HQ.

Provisions of Policy, Direction and Advice to IWL and the Water Quality Branch.

RATIONALE: Develop and administrate policies, programs, and activities of WQB-HQ and provide functional direction to the WQB regional offices in an active and efficient manner.

DESCRIPTION: Provision of policy, advice and guidelines to regional offices in the conduct of Water Quality Branch activities including monitoring and surveys, laboratory operations, data storage and retrieval, data interpretation, water quality objectives, and research coordination.

Provision of information and advice to the DG-IWL and ADM-C&P as well as other federal officials on aquatic environmental issues.

Timely completion of Budget Year Work plans in February 1988. Timely completion of succesion plans. Mid-year third quarter and year-end performance reports in April 1987 and January 1988. Completion of Long Term Operational Plans in December 1987. Training and development plan by January 1988.

Completion of all administration and financial reports in advance of due date.

Staff appraisals completed by March, 1988.

A-BASE RESOURCES: ($'000)	Sub-total	NON A-BASE RESOURCES: ($'000) Sub-total	Total
PY TECH.			
PROF.			
TOTAL PY	4.0		4.0
SALARIES	180.00		180.00
O&M	110.00		110.00
CONTRACTS	-		-
CAPITAL	50.00		50.00
TOTAL	340.00		340.00

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/88

REGION/HQ HQ
PROJECT NUMBER S.Adv.-1

PROJECT TITLE: ADVICE - CANADA-U.S. WATER QUALITY

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management

C&P CODE: 1.6

DURATION: Ongoing

STUDY TEAM: Vacant

Tel: (819) 997-1920

GOALS:

1. Provide a centre within the WQB for effectively responding to and acting for C&P Senior Management on boundary waters issues.
2. To provide information Senior Management on Great Lakes boundary water problems under review by the Great Lakes Water Quality Board (IJC)SO.
3. To provide the Director, WQB, headquarters with advice on the operational activities of the Water Quality Branch.
4. To assist DG-IWL on review of GLWQA.

RATIONALE:
Resolve interjurisdictional water resource problems and realize interjurisdictional water resource opportunities in accordance with national interests.

DESCRIPTION:
Provide expert advice and guidance to DG, ADM and other senior staff.

A-BASE RESOURCES: ($'000)	Sub-total	NON A-BASE RESOURCES: ($'000) Sub-total	Total
PY TECH.			
PROF.			
TOTAL PY			
SALARIES	Note: Resources for this project included under "WQB-Management and administration"		
O&M			
CONTRACTS	-		-
CAPITAL			
TOTAL			

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/88

REGION/HQ HQ
PROJECT NUMBER DIR-2

PROJECT TITLE: MANAGEMENT OF IWD TOXIC CHEMICALS PROGRAM

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

DURATION: Ongoing

STUDY TEAM: Director's Office

Tel: (819) 997-1920

GOALS: Effective and efficient management of IWD Toxic Chemicals program.

RATIONALE:

Toxic Chemicals is high priority program in DOE and IW/L is an important contribution to it. The increasing need for information on the effects of toxic chemicals on the aquatic environment combined with limited resources require effective and efficient management to achieve the program goals.

DESCRIPTION:

Recommend policies and priorities, review plans and resource allocation, and evaluate results.

A-BASE RESOURCES: ($'000)	Sub-total	NON A-BASE RESOURCES: ($'000) Sub-total	Total
PY TECH.			
PROF.	1.0		1.0
TOTAL PY	1.0		1.0
SALARIES	65.0		65.0
O&M	5.0		5.0
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	65.0		65.0

PROJECT DESCRIPTION — REGION HQ
WATER QUALITY BRANCH - 1987/1988 — PROJECT NO. O-1

PROJECT TITLE: WATER QUALITY OBJECTIVES - INTERJURISDICTIONAL

NATIONAL PROGRAM NAME: Canada-U.S. & Interjurisdictional Waters — C&P CODE: 1.1

STUDY TEAM: A.R. Davis, D. McGirr, K. Thibault, M. Taylor, R. Pierce, V. Niemela — TEL: (819) 997-1920

GOALS:
1. Chair and support Ottawa River Water Quality Committee and its subcommittee
2. Provide support to PPWB/COWS, GLWQB/AEOC, Souris River committee etc.
3. Draft report on Canada-U.S. boundary waters.

RATIONALE

All of this work relates to interjurisdictional waters.

DESCRIPTION

WQB/HQ provides secretariat and other support to the Ottawa River Water Quality Committee and its subcommittee. This year the committee will produce another annual report and continue development of objectives.

WQB/HQ also provides advice and other support to the PPWB committee on water quality and the GLWQB Aquatic Ecosystem Objectives Committee.

A report will be prepared this year on Canada-U.S. boundary waters with emphasis on water quality objectives.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	2.8		2.8
TOTAL PY	2.8		2.8
SALARIES	117.80		117.80
O&M	33.75		33.75
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	151.55		151.55

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/1988

REGION HQ
PROJECT NO. 0-2

PROJECT TITLE: PESTICIDES IN THE AQUATIC ENVIRONMENT: THEIR BEHAVIOUR, MEDIA OF ACCUMULATION AND A STRATEGY FOR MONITORING THEM

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

STUDY TEAM: M. Wong

TEL: (819) 953-3197

GOALS: 1. To evaluate the usefulness of chemical specific partition coefficients in predicting the fate and behaviour of currently registered pesticides.

2. To produce pesticide profiles of the media of distribution for selected priority pesticides.

3. To identify and priorize pesticides of concern according to their media of accumulation, toxicity and use pattern.

RATIONALE

To provide scientific advice and information in response to the Agriculture Canada pesticide re-evaluation exercise and to identify pesticides of concern from a water quality perspective.

DESCRIPTION

Standard laboratory measurements such as the n-octanol/water ratio (Kow), soil sorption constant (Koc), bioconcentration factor (BCF), and water/air ration (Kw) which provide an indication of the behavior of a chemical between compartments will be used in an evaluative model (i.e. NRCC Persistence, Fugacity Level I, McCall's model ecosystem) to estimate the behavior of in-use pesticides in the aquatic systems.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.5		0.5
TOTAL PY	0.5		0.5
SALARIES	21.00		21.00
O&M	5.00		5.00
CONTRACTS	15.00	25.00	40.00
CAPITAL	-	-	-
TOTAL	41.00	25.00	66.00

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/1988

REGION HQ
PROJECT NO. O-3

PROJECT TITLE: WATER QUALITY GUIDELINES FOR PESTICIDES

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

STUDY TEAM: M. Wong, M.C. Taylor, A.R. Davis

TEL: (819) 953-3197

GOALS: 1. Develop water quality guidelines for pesticides.

2. Report on the utilization of IWD pesticide resources and priorities for 1987/88.

3. Review information on in-use pesticides for Department of Agriculture pesticide re-evaluation program.

RATIONALE

The project is part of the IWD Pesticide Plan.

DESCRIPTION

Guidelines for in-use pesticides will be developed on an ongoing basis in response to CCREM Task Force needs and also after consultation with Environment Canada and Agriculture Canada priority lists.

In-use pesticides will be re-evaluated as required in the IWD Pesticide Plan. The IWD priorities are studied and advice given on efficient use of IWD Pesticide Plan resources.

	A-BASE RESOURCES: ($'000)	NON A-BASE RESOURCES: ($000)	
	Sub-total	Sub-total	Total
PY TECH.			
PROF	1.5		1.5
TOTAL PY	1.5		1.5
SALARIES	62.00		62.00
O&M	12.50		12.50
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	74.00		74.50

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/1988

REGION HQ
PROJECT NO. O-4

PROJECT TITLE: CANADIAN WATER QUALITY GUIDELINES

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

STUDY TEAM: M.C. Taylor, R.C. Pierce, M.P. Wong, B.C. Chu, A.R. Davis and Regional staff

TEL: (819) 953-3198

GOALS:
1. To continue writing water quality guidelines and to update current guidelines as required.
2. Represent DOE on Federal-Provincial Drinking Water Subcommittee.
3. Present report on research needs to CCREM.

RATIONALE

The CCREM has requested the WQB to chair the Task Force on Water Quality Guidelines and to coordinate new guidelines. The WQB provides the Environment Canada member of the Federal-Provincial Drinking Water Subcommittee.

DESCRIPTION

The final drafts (English and French) of the Canadian Water Quality Guidelines were presented to the CCREM at the October 1986 meeting. The guidelines were published in April 1987. Environment Canada (WQB) continues to be responsible for writing new guidelines and updating existing ones as new information becomes available.

The WQB represents Environment Canada on the Federal-Provincial Water Subcommittee and reviews all draft drinking water guidelines as they become available. The member advises the Subcommittee on CCREM Task Force activities.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	2.2		2.2
TOTAL PY	2.2		2.2
SALARIES	91.00		91.00
O&M	18.00		18.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	109.00		109.00

PROJECT DESCRIPTION — REGION HQ
WATER QUALITY BRANCH - 1987/1988 — PROJECT NO. A-1

PROJECT TITLE: MONITORING AND FEDERAL-PROVINCIAL AGREEMENTS

NATIONAL PROGRAM NAME: Water Quality Management Data — C&P CODE: 1.3

STUDY TEAM: T. Dafoe, R. Kwiatkowski, B. Switzer — TEL: (819) 997-3422

GOALS:

1. Complete negotiations with New Brunswick, Manitoba and Saskatchewan; continue negotiation with Ontario, P.E.I. and the Territories and initiate negotiations with Nova Scotia,
2. Implement and review Quebec, Newfoundland and B.C. Agreements.
3. Produce proceedings from the Northern Water Quality Monitoring Workshop.
4. Review technical plans for Quebec, B.C. and Newfoundland to ensure adequate water quality data.
5. Provide centralized administration for financial and scientific aspects of agreements.
6. Develop the National Index Network.
7. Identify and test through pilot projects, multi-media monitoring techniques.

RATIONALE

There is a need for a comprehensive water quality assessment strategy in Canada using multi-media sampling. The cost efficient means of achieving this assessment is through federal-provincial agreements that will encourage exchange of information and cooperative studies and will make water quality data directly available to provincial and federal water quality managers. A national baseline toxic chemicals program should be part of the Federal- Provincial Water Quality Agreements.

DESCRIPTION

As described in the "Water Quality Branch Strategy for Assessment of the Quality of the Aquatic Environment (1986).

	A-BASE RESOURCES ($'000)	Total
PY PROF.	4.00	4.00
TOTAL PY	4.00	4.00
SALARIES	187.40	187.40
O & M	* 30.00	* 30.00
CONTRACTS	-	-
CAPITAL	-	-
TOTAL $	217.40	217.40

* includes 10K agreements resources

Status of the Federal-Provinical Water Quality Monitoring Agreements

Province	Negotiations Start	Negotiations Completed	Agreements Signed	Signature Projected
Quebec	September 1982	December 1983	May 1984	
British Columbia	December 1983	June 1985	October 1985	
Newfoundland	October 1983	November 1985	April 1986	
Alberta	May 1983	May 1986		No Alberta interest at this time
New Brunswick	November 1984			April 1988
Manitoba	May 1984			June 1988
Saskatchewan	September 1985			December 1987
Ontario	April 1986			December 1987
Prince Edward Island	June 1986			June 1988
Nova Scotia	Letter sent			June 1989
Yukon	December 1985			March 1988
Northwest Territories	To commence December 1986			March 1988

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/1988

REGION/HQ HQ
PROJECT NUMBER DS-1

PROJECT TITLE: COORDINATION OF WQB QA/QC ACTIVITIES

NATIONAL PROGRAM NAME Water Quality Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: J. Gaskin TEL: (819) 953-3202

GOALS:

To develop, implement and coordinate QA/QC activities within the WQB to ensure that data collected are of known high quality.

RATIONALE:

It is important the WQB staff and clients can show that data obtained from NAQUADAT and used in interpretive reports are of known high quality.

DESCRIPTION:

Develop and publish protocols for the quality assurance aspects of field sample collection, laboratory analysis and data validation and oversee the implementation of these protocols across the WQB programs.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	1.0		1.0
SALARIES	46.80		46.80
O&M	4.00		4.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	50.80		50.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/1988

REGION/HQ HQ
PROJECT NUMBER DS-2

PROJECT TITLE: NAQUADAT; MANUALS, GUIDELINES PUBLICATIONS AND DATA BASE PROMOTION

NATIONAL PROGRAM NAME Water Quality Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: P. Brooksbank and Data Systems Section TEL: (819) 997-3424

GOALS:

1. Preparation and distribution of information relating to the NAQUADAT data base.

2. Promote the use of the NAQUADAT Data Base.

RATIONALE:

To inform existing and prospective clients of the features and data holdings of NAQUADAT.

DESCRIPTION:

The following are scheduled for 1987/88

1. NAQUADAT Dictionary of Parameter Codes
2. Completion of the User Manual
3. Completion of the Newfoundland Data Report
4. 1984/85 WN&R Data Report
5. 1988 Station Listing
6. Demonstration of NAQUADAT at 4 conferences

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF			
TOTAL PY	1.15		1.15
SALARIES	53.80		53.80
O&M	11.00		11.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	64.80		64.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/1988

REGION/HQ HQ
PROJECT NUMBER DS-3

PROJECT TITLE: NAQUADAT - NATIONAL WATER QUALITY DATA BASE

NATIONAL PROGRAM NAME Water Quality Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: P. Brooksbank, J. Cree, M. Charette, P. Beaudoin TEL: (819) 953-1556

GOALS:

To effectively archive, manage and disseminate Water Quality Branch data.

RATIONALE:

FPSIW Article 9 and support for all other WQB activities.

DESCRIPTION:

This project encompasses the basic core services of NAQUADAT - the continuing updating, maintaining and improving of the water quality data base. It includes safeguarding and managing all WQB analytical results and the management of the Dictionary file of parameters, as well as the five System 2000 data bases. It includes the provision of information and other aspects of electronic data processing of results. It covers training, program development and documentation as well as Novel EDP applications such as developing prototype databases, new computer programs and colour graphics routines.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF			
TOTAL PY	2.0		2.0
SALARIES	93.20		93.20
O&M	35.00		35.00
CONTRACTS	-		-
CAPITAL	56.00		56.00
TOTAL	184.20		184.20

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/1988

REGION/HQ HQ
PROJECT NUMBER DS-4

PROJECT TITLE: FEDERAL-PROVINCIAL AGREEMENT ON DATA MANAGEMENT

NATIONAL PROGRAM NAME Water Quality Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: P. Brooksbank, J. Cree, M. Charette, P. Beaudoin TEL: (819) 997-3424

GOALS:

To archive and provide data on water quality in accordance with federal/provincial agreements.

RATIONALE:

Data management is an integral part of the federal-provincial agreements.

DESCRIPTION:

The comparability of federal and provincial data management techniques will be evaluated and the mechanisms and costs of timely data exchange and storage will be determined. Computer programs will be prepared to transfer data between provincial signatories and NAQUADAT. The performance target for data exchange is to be able to verify and store 50% of the data received from cooperating provincial agencies within two weeks and to be able to transfer 90% of federal data requested by a province within a similar period.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	1.0		1.0
SALARIES	46.80		46.80
O&M	10.00		10.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	56.80		56.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/88

REGION/HQ HQ
PROJECT NUMBER DS-5

PROJECT TITLE: GLOBAL ENVIRONMENTAL MONITORING SYSTEM

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: P. Brooksbank TEL: (819) 997-3424

GOALS:
To coordinate the Canadian input to the GEMS/WATER monitoring scheme.

RATIONALE:
The Global Environmental Monitoring System (GEMS) began as an outcome of the United Nations Conference on the Human Environment held in Stockholm in June 1972. The water component (GEMS/Water) of this project is a joint UNESCO and WHO operation which attempts to monitor long-term trends in water pollution of a selected numbers of rivers, lakes and ground water around the world. The purpose of the monitoring is to detect any serious deterioration of the environment as a result of the introduction of man-made pollutants, and to provide advance warning to mankind. Under the program a global network of monitoring stations has been established and uniform methods of sampling and analysis are being promoted. The data from the world-wide monitoring program is managed in the GLOWDAT database facility at the Canada Centre for Inland Waters.

DESCRIPTION:
The Water Quality Branch provides the Canadian input to the GEMS program. Data from selected rivers and lakes are forwarded periodically from NAQUADAT to the GLOWDAT data handling system. The GEMS requirements are met through regular WQB monitoring but with a commitment to maintain on-going monitoring at the 13 sites designated for the global program. Additionally, the WQB provides support and advice for GLOWDAT data management as requested by the Collaborating Centre at NWRI, as well as expert advice on project reviews and evaluation of the entire GEMS program.

A recent evaluation of the GEMS/WATER data has suggested changes required to the monitoring scheme. The WQB will adapt to respond to identified needs.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	0.1		-.1
SALARIES	6.00		6.00
O&M	-		-
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	6.00		6.00

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/88

REGION/HQ HQ
PROJECT NUMBER DS-6

PROJECT TITLE: DATA MANAGEMENT - TOXIC SUBSTANCES

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

DURAITON: Ongoing

STUDY TEAM: P. Brooksbank, J. Cree, M. Charette, P. Beaudoin

TEL: (819) 953-1556

GOALS:
To effectively archive, manage and disseminate information on toxic substances measured by the Water Quality Branch so as to be able to classify toxic substances and indicate environmental levels throughout Canada.

RATIONALE:
The pervasiveness of toxic chemicals and the high priority placed on their assessment and control require that monitoring data be readily available for inspection and analysis. The NAQUADAT data system serves as the repository for this information.

DESCRIPTION:
Toxic chemicals will be classified in the NAQUADAT Dictionary of parameters and monitoring results will be entered onto the appropriate NAQUADAT data base. All requests for information will be handled expeditiously. A prototype data base for biological media will be designed.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF			
TOTAL PY	1.5		1.5
SALARIES	69.40		69.40
O&M	10.00		10.00
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	79.40		79.40

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/1988

REGION/HQ HQ
PROJECT NUMBER S&IS-2

PROJECT TITLE: WATER QUALITY INTERPRETIVE REPORTS

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

STUDY TEAM: A. Demayo, E. Watt, J. Temple, A. Baweja TEL: (819) 997-3423

GOALS:

Preparation and publication of water quality intepretative reports to disseminate information on water quality to resource managers, consultants and the general public.

RATIONALE:

In the last several years the issue of water quality has come to the forefront of resource and environmental management aspects of Canadian society. In this context the water quality interpretative reports have an important role in bringing the data collected to the resource managers in a form which can be used in the decision making process. In addition, the reports inform the Canadian public about the state of water resources in the country.

DESCRIPTION:

Included in the 1987/1988 are the following projects:

1. Major ions in selected river basins of Canada.
2. Impact of Agricultural Activities on Water Quality.
3. Metals in Selected river basins.
4. Radioactivity in the Aquatic Environment.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF	4.0		4.0
TOTAL PY	4.0		4.0
SALARIES	118.30		118.30
O&M	8.62		8.62
CONTRACTS	-		-
CAPITAL	-		-
TOTAL	126.92		126.92

* salary deduction of 69.0 reflected here actually is spread throughout M&S

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1987/1988

REGION/HQ HQ
PROJECT NUMBER S&IS-2

PROJECT TITLE: TOXIC CHEMICALS IN CANADIAN SURFACE WATERS

NATIONAL PROGRAM NAME Toxic Chemicals C&P CODE: 4.1

STUDY TEAM: A. Demayo, A. Baweja TEL: (819) 997-3423

GOALS:

1. Develop an all-weather precipitation sampler to collect samples for analysis of organic compounds (in collaboration with NWRI).
2. Coordinate Radionuclides Monitoring Program.

RATIONALE:

Toxic Chemicals is a high priority program in Environment Canada and the WQB is responsible for providing the information related to the quality of the aquatic environment.

DESCRIPTION:

1. Build new prototype precipitation sampler (in collaboration with NWRI) and carry out field testing. Conduct extraction efficiency tests.
2. Prepare specifications for the construction of additional samplers.
3. Coordinate WQB Radionuclides Monitoring Program, establish a data base (NAQRADNUC for federal and provincial radionuclide data.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	0.5		0.5
TOTAL PY	0.5		0.5
SALARIES	22.70		22.70
O&M	6.40		6.40
CONTRACTS	-		-
CAPITAL	12.70		12.70
TOTAL	41.80		41.80

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT NUMBER S&IS-3

PROJECT TITLE: SURFACE WATER MONITORING FOR LRTAP ASSESSMENT

NATIONAL PROGRAM NAME: Long Range Transport of Airborne Pollutants

C&P CODE: 4.2

STUDY TEAM: Vacant (Interim: A. Demayo)

TEL: (819) 997-3423

GOALS:

To develop, implement and coordinate a surface water monitoring network for Canada, capable of defining rates of changes in aquatic regime major ion and trace metal content.

RATIONALE:

Long range atmospheric transport has been identified as a very important pathway be which various pollutants reach aquatic ecosystems. LRTAP is a priority in DOE.

DESCRIPTION:

The network collects good, quality assured data suitable for assessing the long-term trends in water quality related to the LRTAP Program. The network has been in operation since April 1983 and is starting to produce results. More emphasis will be put into assessing these preliminary data.

	A-BASE RESOURCES: ($'000) Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH.			
PROF	1.5	-	1.5
TOTAL PY	1.5		1.5
SALARIES	68.0	-	68.00
O&M	-	-	15.00
CONTRACTS	-	15.00	-
CAPITAL	-	-	-
TOTAL	68.00	15.00	83.00

NATIONAL LABORATORY

Laboratoire nationale

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987/1988

REGION HQ
PROJECT NO. L-1

PROJECT TITLE: ANALYTICAL SERVICES - FEDERAL/PROVINCIAL AGREEMENTS

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

DURATION: Ongoing

STUDY TEAM: Project Coordinator - Dr. B.K. Afghan TEL: (416) 336-4648

GOALS:
1. Provide Analytical Support Services to Water Quality Monitoring Agreements.
2. To maintain Analytical Capabilities for Complex Physical and Chemical Analyses related to Aquatic Eco-Systems.

RATIONALE:

There is a requirement to provide analytical support to negotiated Water Quality Agreements with the Provinces.

DESCRIPTION:

Provision of direct analytical services to support signed Federal/Provincial Monitoring Agreements.

	A-BASE RESOURCES ($'000): Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF.	12.0		12.0
TOTAL PY	12.0		12.0
SALARIES	372.00		372.00
O & M	100.36		100.36
CONTRACTS			
CAPITAL	16.50		16.50
TOTAL	488.86		488.86

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987-1988

REGION HQ
PROJECT NO. L-2

PROJECT TITLE: ANALYTICAL SERVICES ENVIRONMENTAL PARAMETERS

NATIONAL PROGRAM NAME: Water Quality Management Data ECS CODE: 1.3

DURATION: Ongoing

STUDY TEAM: Project Coordinator - Dr. B.K. Afghan TEL: (416) 336-4648

GOALS:

1. To provide a National analytical support service to inter-departmental agencies.

2. To maintain analytical capabilities for complex chemical and physical analyses on a wide variety of water, wastewater, precipitation, sediment, biota and other substrates related to the aquatic ecosystem in support of studies related to enivronmental management and protection and related research.

RATIONALE:

As part of the C&P mandate for the generation of physical, chemical and biological environmental data in relation to the Canada Water Act, Canada/U.S. Water Quality Agreement, Fisheries Act, Environmental Contaminants Act and the Federal Policy Statement on Inland Waters.

DESCRIPTION:

Provision of direct analytical services to the following activities:

- Programs of the five Water Quality Branch regions across Canada.
- NWRI research projects.
- Great Lakes Water Quality program.
- Operation of the ship board laboratory to analyse Great Lakes waters.
- Atmospheric Environmental Services precipitation program.
- Environmental Protection Services program.
- GLLFAS research and monitoring projects.

	A-BASE RESOURCES ($'000): Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF.	21.0		21.0
TOTAL PY	21.0		21.0
SALARIES	652.00		652.00
O & M	292.42		292.42
CONTRACTS	-		-
CAPITAL	244.50		244.50
TOTAL	1188.92		1188.92

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987-1988

REGION HQ
PROJECT NO. L-3

PROJECT TITLE: ANALYTICAL SERVICES - TOXIC SUBSTANCES

NATIONAL PROGRAM NAME: Toxic Chemicals ECS CODE: 4.1

DURATION: Ongoing

STUDY TEAM: Project Coordinator - Dr. B.K. Afghan TEL: (416) 336-4648

GOALS:

1. To provide a National analytical support service.

2. To maintain complex analytical methodology on organic and inorganic toxic substances on a wide variety of water, wastewater, precipitation, sediment, biota and other related aquatic substrates in support of toxic substances studies carried out by environmental agencies.

RATIONALE:

As part of the C&P mandate for the generation of physical chemical and biological environmental data in relation to the Canada Water Act, Canada/U.S. Water Quality Agreement, Fisheries Act, Environmental Contaminants Act and the Federal Policy Statement on Inland Waters.

DESCRIPTION:

Provision of direct analytical services to the following activities:

- Programs of the five Water Quality Branch regions across Canada.
- NWRI research projects.
- Great Lakes Water Quality Program
- Operation of the ship board laboratory to analyse Great Lakes waters.
- Atmospheric Environmental Services precipitation program.
- Environmental Protection Services program.
- GLLFAS research and monitoring projects.
- *IW/LD Pesticide Program activities initiated by WQB-HQs.

	A-BASE RESOURCES ($'000): Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF.	9.0		9.0
TOTAL PY	9.0		9.0
SALARIES	279.00		279.00
O & M	106.00	*78.25	184.25
CONTRACTS			
CAPITAL	-		-
TOTAL	385.00	*78.25	463.25

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987-1988

REGION HQ
PROJECT NO. L-4

PROJECT TITLE: ANALYTICAL SERVICES - NIAGARA RIVER
WATER QUALITY MONITORING CHEMICALS
MONITORING OF THE ST. CLAIR RIVER

NATIONAL PROGRAM NAME: Canadian/U.S. Interjuristictional Water Management

C&P CODE: 1.1

DURATION: Ongoing

STUDY TEAM: Project Coordinator - Dr. B.K. Afghan TEL: (416) 336-4661

GOALS:

1. To provide Analytical Support Service to WQB-OR by analyzing the water and suspended sediments collected weekly at Fort Erie and Niagara-on-the-Lake, for trace metals, volatiles and semi-volatile organic contaminants.

2. To provide analytical services for quantifying toxic chemicals i the St. Clair River.

RATIONALE:

In support of GLWQP to fulfill Canada's commitment to monitor water quality for long term trend evaluation and to provide annual estimates of material loads from ake Erie to Lake Ontario.

To fulfill Canada's commitment to carry out monitoring of toxic substances in the St. Clair River under 1978 GLWQA.

DESCRIPTION:

Water and suspended sediments are collected at Niagara-on-the-Lake and at Fort Erie by an automatic sampler and returned to Burlington for analysis. The water samples and suspended sediments are collected weekly for volatiles and semi-volatile organic compounds as well as trace metals. The analysis of organic contaminants is undertaken by Mann Testing Laboratory staff located at the National Water Quality Laboratory. The National Water Quality Laboratory staff ensures that appropriate techniques are used with sufficient Quality Control to obtain data with well defined confidence intervals. The staff of the National Water Quality Laboratory also maintains close contact with Mann Testing (M. Forbes, Scientific Authority).

	A-BASE RESOURCES ($'000): Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF.			
TOTAL PY	-	-	-
SALARIES	-		-
O & M	-	160.0	160.0
CONTRACTS			
CAPITAL	-	-	-
TOTAL		160.00	160.00

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1987-1988

REGION HQ
PROJECT NO. L-5

PROJECT TITLE: LABORATORY SERVICES TO SUPPORT PRECIPITATION MONITORING NETWORK OPERATED BY AES

NATIONAL PROGRAM NAME: Long range transportation of Air Pollutant

C&P CODE: 4.2

DURATION: Ongoing

STUDY TEAM: Project Coordinator - Dr. B.K. Afghan

TEL: (416) 336-4661

GOALS:

1. To provide analytical services to AES in support of the Canadian Air and Precipitation Monitoring Network (CAPMON).

RATIONALE:

With the emergence of serious and internationally-sensitive environmental issues attributed to ACID RAIN and the long range transport of other air pollutants, Treasury Board authorized the establishment of CAPMoN by the AES. Since AES lacked the laboratory facilities to provide the necessary analytical support for a chemical monitoring network, the National Water Quality Laboratory was instructed to carry out this element of the program. The service is provided by contractual arrangement with Agrodev Canada Inc. The staff of Agrodev work at the National Water Quality Laboratory to carry out analysis. The scientific authority is Mr. H. Agemian of the National Water Quality Laboratory. The staff of the National Water Quality Laboratory provides the project management functions as well as ensures that appropriate methodology and Q.A. is implemented to generate reliable data.

DESCRIPTION:

The estimated workload is 7,500 samples per year for eleven parameter per sample over a proposed five-year period. Due to international sensitivity associated with acidic atmospheric deposition, the analycal work must be validated and supported through the use of stringent quality assurance protocol. The National Water Quality Laboratory ensures that analytical work is conducted using validated methodologies. The routine quality control is maintained which yields quantitative information on the degree of accuracy and precision of measurements.

	A-BASE RESOURCES ($'000): Sub-total	NON A-BASE RESOURCES: ($000) Sub-total	Total
PY TECH. PROF.			
TOTAL PY	-	-	-
SALARIES	-		-
O & M	-	127.0	127.0
CONTRACTS			
CAPITAL	-	-	-
TOTAL		127.00	127.00